

THE IRON AGE

THURSDAY, OCTOBER 13, 1892.

The Betts Turning and Boring Mill.

The unusual demand which has developed for the turning and boring mills built by the Betts Machine Company of Wilmington, Del., has led them to make a special effort to furnish a thoroughly first-class machine of this kind. With this object in view they have perfected the design and construction of their mills, as

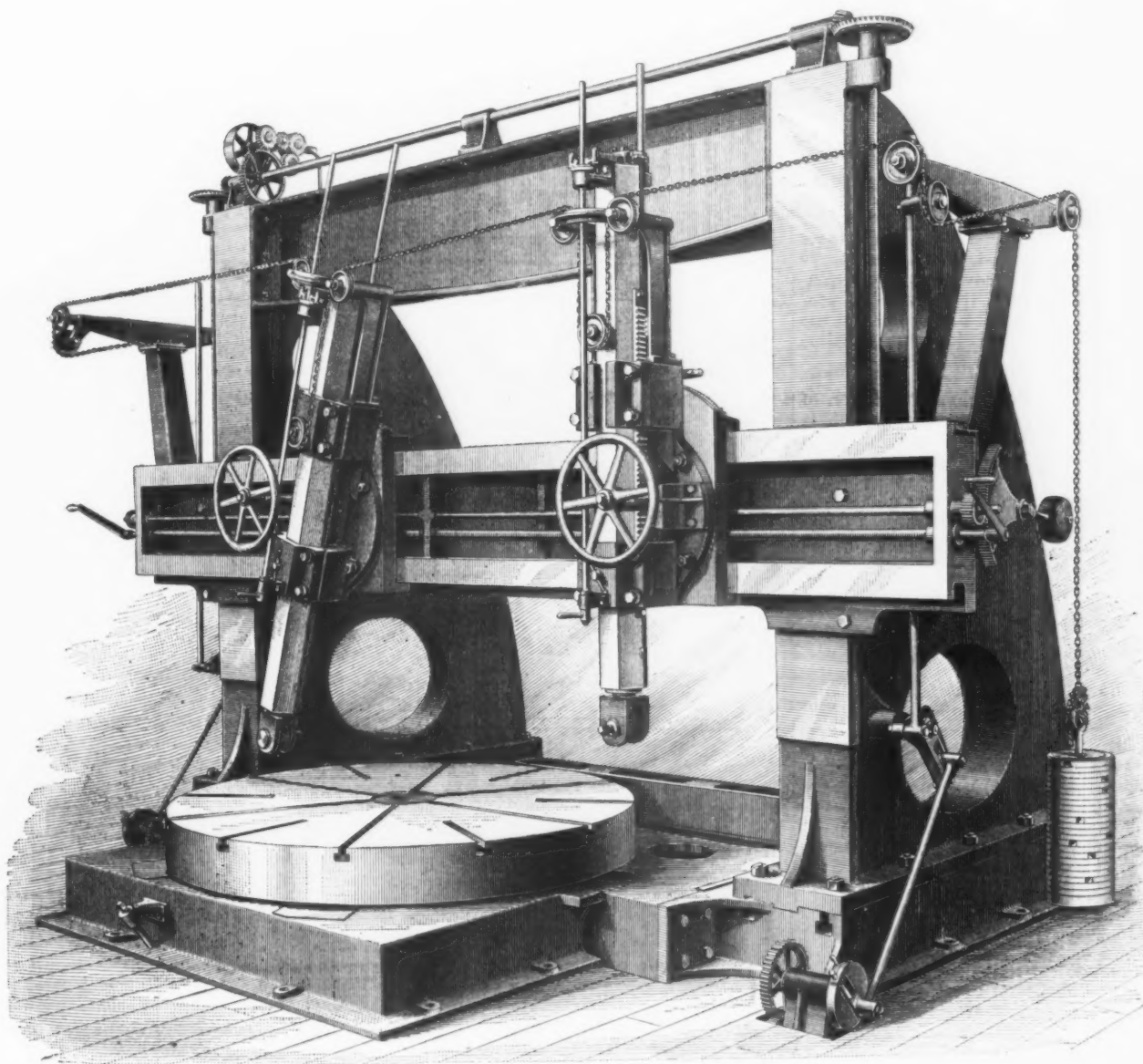
shown in Fig. 5, of a center portion with two sides extended backward, and upon these sides rest the uprights.

The table is driven by an internal spur wheel and a forged steel pinion, and is attached to a heavy and long spindle at its center, as shown in Figs. 2 and 3.

The spindle is carried in an adjustable bearing in the bed plate, while its lower end rests on a steel step and wedge inclosed in another adjustable bearing. On

ing shaft is of large diameter and runs in long bearings. The driving cones are provided with a convenient number of speeds and generous belt width.

The uprights, Figs. 2 and 4, are of the box or double plate pattern; have wide faces and long bases. They are amply secured with bolts which fit in T slots in the side pieces of the bed plate, thus allowing the mill to enlarge its swing. The front ends of the uprights are provided with



THE BETTS 14-FOOT TURNING AND BORING MILL.

suggested by experience. The latest improvements made by them are shown in the engravings here presented, which illustrate a 14-foot mill built for the Pennsylvania Iron Works of Philadelphia.

The machine consists essentially of a bed plate carrying a rotating table or face plate, two uprights or standards, a cross rail carrying two saddles with their tool spindles and attachments, and the driving mechanism necessary to move the table and tool spindles.

The bed plate is of box form, of heavy action, well braced, with ample flanges, and has the gearing for driving the table firmly secured to it. It consists,

the bottom side of the table is an annular bearing which is a part of the bed plate, for the sustaining of heavy loads on the table; when light loads are being handled the wedge under the bottom step can be pushed in by operating a square-ended rod in the bed plate beside the table, thus raising the table off the annular bearing, allowing it to run lightly for faster speeds. The table is well provided with T slots to secure work.

The driving gears are all cut from the solid, and all spur pinions are of forged steel. The pitch and face of the gears are large and have proven very successful in wearing qualities and strength. The driv-

taper dowels to bring them into alignment after being moved.

The cross rail, Figs. 6 and 7, is made deep in its bearing on the face of the uprights and is secured by a long clamp extending its full depth. It is of heavy box section, with large wearing surface, and has a square lock for the saddles, both top and bottom, thus always taking the strain in a manner to best resist wear and spring. The saddles have a long bearing on the cross rail. The face of the saddle is provided with a circular T slot, which receives the bolts, and these secure the index plates or swivels. The index plates carry the tool spindles or cutter bars in a

slide on their face, and these are also provided with a square lock, as in the case of the cross rail. The tool spindles are provided with a rack and pinion for quick motion up or down, and are fed by means of a screw; the ends of the spindles are provided with a special tool holder, in which the tool can be fastened and adjusted with as much ease and as great scope as in a lathe. Each spindle is counterbalanced in all positions, and the counterbalance does not interfere in any way with the setting of the index plates. Two complete sets of feeds are provided, making each saddle as independent of the other as though on separate machines. These feeds cover a large range, are large in number and have ample power; they are by hand or power in all directions. The cross rail is moved by power. Provision is made for taking up the wear in both the saddles and tool spindles.

When desired, this mill is provided with a slotting attachment for cutting key ways, &c. For this purpose one tool spindle is furnished with an attachment which gives it an automatically reciprocating motion, thus converting it temporarily into a slotter. This device does not interfere with the tool spindle, except when in use, and can be attached or detached in a few minutes. It will cut taper or straight, as desired, and has a stroke almost equal to the movement of the spindle. When required, there are also provided a traveling head boring bar and the necessary attachments for boring cylinders in a vertical position.

The ratio of gearing is 232 to 1. The cone pulleys are 26½ inches in diameter, of five steps, for 4½-inch belt. The mill is back geared, and there are two speeds on the countershaft, giving 60 changes of speed on the table. The feeds are positive and independent on both sides of the machine. They vary from ⅜ inch to 1½ inches per revolution for cross feeds and ⅜ inch to ¼ inch for regular and vertical feeds. The machine will take work 8 feet high, will swing 14 feet 5 inches, and weighs 121,800 pounds.

Engines on a Battle Ship.

Industry applied to George W. Dickie, manager of the Union Iron Works, San Francisco, for particulars respecting the number of steam engines on the battle ship "Oregon." Mr. Dickie has sent the following list, set down from memory, which is here arranged in tabular form:

| Number of engine cylinders. | Purpose of engines. | Character of engines. | Diameter of cylinders in inches. | Stroke in inches. |
|-----------------------------|-------------------------------------|-----------------------|----------------------------------|-------------------|
| 6 | Main driving, 9000 horse-power..... | Triple | 34½ 48 75 | 42 |
| 4 | For air pumps..... | Double | 6 | 12 |
| 4 | For circulating pumps..... | Comp'd | 7 12 | 6 |
| 2 | Hot well pump engines..... | Single | 8 | 16 |
| 2 | Fire and bilge pump engines..... | Single | 10 | 16 |
| 2 | Air and circulating pumps..... | Single | 10 | 16 |
| 4 | Ventilating fans..... | Comp'd | 5 9 | 6 |
| 4 | Barring engines..... | Double | 6 | 6 |
| 2 | Reversing engines..... | Single | 14 | 18 |
| 4 | Hydraulic steering gears..... | Double | 8 | 12 |
| 4 | Main feed pumps..... | Single | 12 | 16 |
| 4 | Auxiliary feed pumps..... | Single | 10 | 16 |
| 8 | Ash hoisting..... | Single | 5 | 6 |
| 16 | Fireroom fans..... | Comp'd | 5 9 | 6 |
| 4 | Steam cranes..... | Double | 8 | 10 |
| 12 | Hydraulic pumping..... | Single | 20 | 30 |
| 8 | Steam winches..... | Double | 8 | 10 |
| 2 | Windlass engines..... | Double | 16 | 12 |
| 2 | Dynamo engines..... | Comp'd | 7 12 | 6 |
| 2 | Ice machines..... | Double | 12 | 16 |
| 2 | Ventilation..... | Comp'd | 5 9 | 6 |
| 1 | Distilling room air..... | Single | 10 | 12 |
| 1 | Water and brine..... | Single | 6 | 10 |

Besides this list, making 112 engines, counting each steam cylinder, there are some connected with the torpedo service, the dimensions of which are not yet determined. After looking over this list one will conclude that the steam machinery of a modern warship is the principal part.

and will outlive two or three wooden vessels. It is known, by actual measurements made by insurance companies, that the weight of the wooden hull is about one-third of the displacement, and that the weight of the cargo is about three-fifths. The rate of hull to cargo is, there-

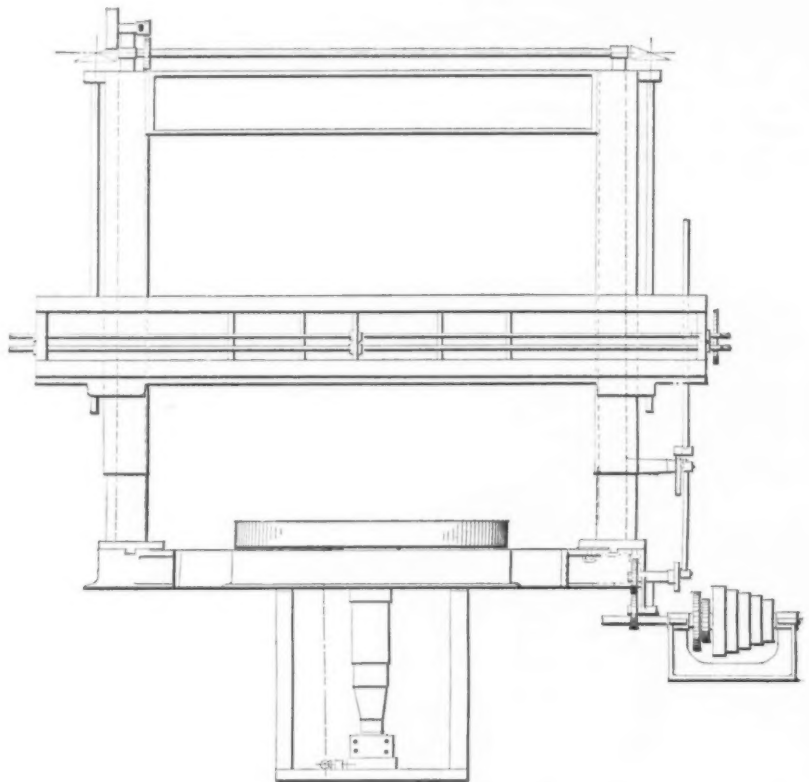


Fig. 2.—Vertical Cross Sectional Elevation.

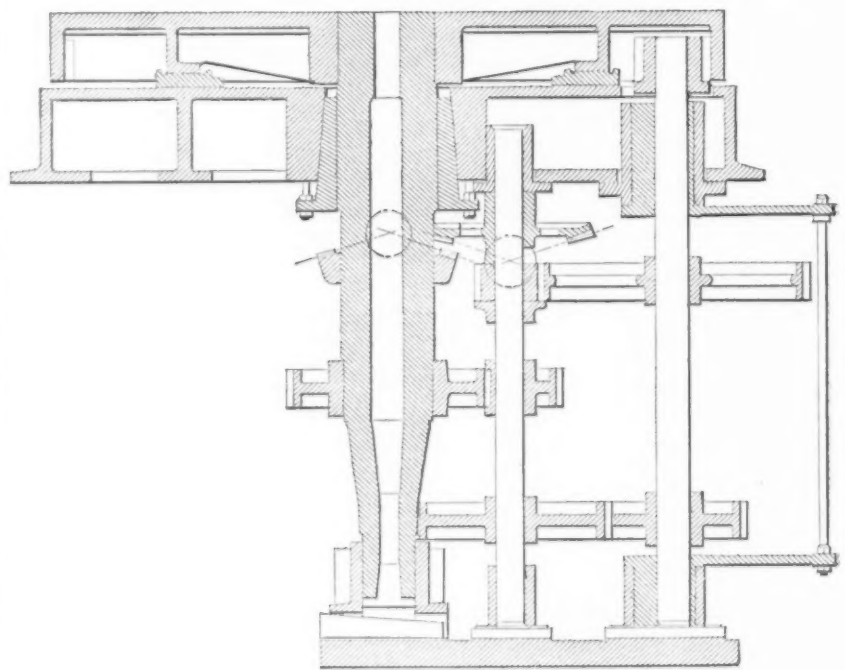


Fig. 3.—Vertical Section Through Bed Plate and Table.

THE BETTS 14-FOOT TURNING AND BORING MILL.

She is, indeed, a great magazine of machinery, much of it of a delicate nature, and all requiring intelligent care.

An iron ship is more profitable than a wooden one, because it will carry more cargo than the latter, at a lower rate of insurance, will command a better freight,

fore, about 5 to 9. By taking the average of a large number of ships made of wood, and of others made of iron, it has been found that the iron ships weigh, when built, about 27 per cent. less than wooden ones. As the weight of cargo and hull are in the proportion of 5 to 9, the iron hull will have the advantage in carrying capacity by ⅔ of 27, or 15 per cent.—that

is, an iron ship will carry 115 tons for every 100 tons carried by a wooden ship when both are of the same outside dimensions and both are loaded to the same draft of water.

F. R. Phillips of Philadelphia announces that a partnership has been effected between himself and George C. Waldo, president of the Excelsior Bank, New York, under the style of the Phillips

The Shipping Bounty Question in France.

BY A NAVAL OFFICER.

In 1881, after a prolonged discussion, a law was adopted in France providing for the payment of Government bounties for shipping construction and for oversea navigation. This law embodied a clearly

time, but it was decided this summer to postpone the question until the autumn of the present year. A convenient opportunity is thus afforded for a general review of the subject, which is one of interest in this country under existing conditions, since it is becoming more and more apparent that the problem of the rehabilitation of the American merchant marine will demand a large share of the attention of our legislators in the near future.

The law of 1881 resulted from a depressed condition of French shipping interests, which had continued a number of years. During this period the outlook had become more and more gloomy, until there was a general agreement of opinion that it was absolutely necessary for the Government to take vigorous steps to avert disaster. Accordingly, the law to which reference has been made was enacted, providing for the payment of bounties of two kinds, construction bounties and navigation bounties.

The construction bounties, payable for sea-going vessels built in France, were authorized as compensation for the charges indirectly imposed upon the builders by the customs tariff. They were as follows:

Per Ton, Gross Measurement.

| | |
|---|---------|
| For iron or steel vessels. | \$11.58 |
| For wooden vessels of 200 tons and above. | 3.86 |
| For wooden vessels of less than 200 tons. | 1.83 |
| For composite vessels. | 7.72 |

For engines and boilers, including auxiliary machinery as put on board new steamers, a bounty of \$2.32 per 100 kg. (equal to \$1.05 per 100 pounds) was provided. Changes having the result of increasing the measurement of a vessel gave right to a bounty calculated, for such increase, on the same scale as the allowance for a new vessel. Replacing old boilers carried a compensation of \$1.54 per 100 kg. (or 70 cents per 100 pounds) for the weight of the new boilers, without tubes, when of French make.

The navigation bounties were to be paid to French sailing ships and steamers making oversea voyages; they were not to be paid to vessels engaged in the fisheries, nor to those engaged in regular service on subsidized routes, nor to pleasure craft. These bounties were fixed at so much per ton net measurement for every 1000 miles run, the amount per ton for each 1000 miles being 29 cents for new French-built vessels, this amount decreasing annually $1\frac{1}{4}$ cents for wooden vessels, $1\frac{1}{2}$ cents for composite vessels and 1 cent for those of iron. Vessels built abroad but sailing under the French flag and making oversea voyages were allowed one-half the bounty to which they would have been entitled had they been built in France. For the purpose of applying these provisions official distance tables were issued by the French Government. An increase of 15 per cent was allowed on the navigation bounty in the case of steamers built in France on plans previously approved by the Navy Department. The law also provided that in case of war French merchant vessels might be taken for public use.

Special rules were formulated by the Minister of Marine stating the conditions under which steamers built in France would be entitled to the increase of 15 per cent. on the navigation bounty. Those rules provided for special inspections, boiler tests, requirements to insure stability, subdivision by bulkheads, the attainment of a speed of $13\frac{1}{2}$ knots when loaded to a prescribed draft, a coal-carrying capacity sufficient to insure the possibility of steaming 6000 miles at a speed of 10 knots, an arrangement of bunkers permitting coal protection for the engine and boilers, the total submersion of the propeller, permanent fittings, and structural strength to permit the carrying of a battery of 54-inch guns, suitable arrange-

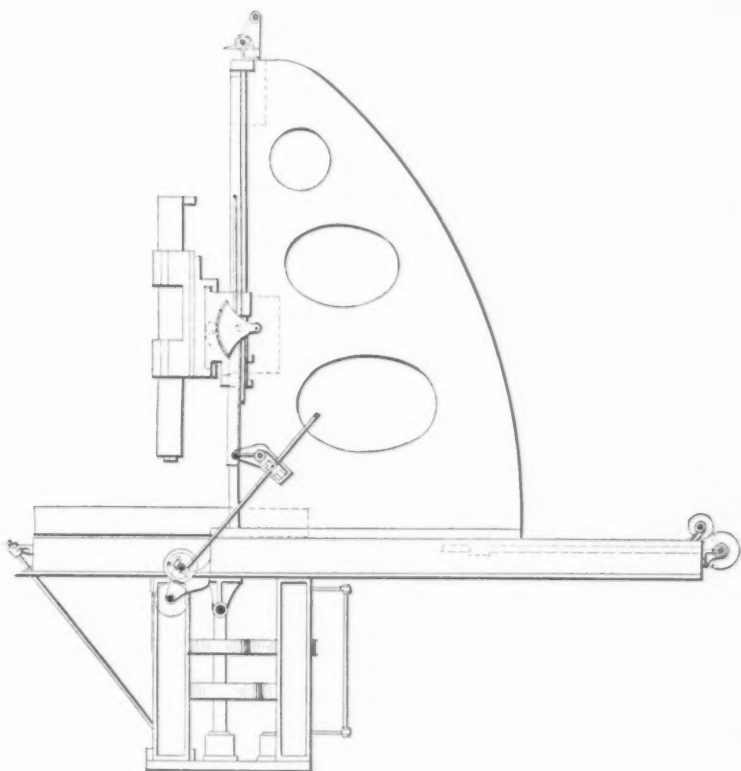


Fig. 4.—Side Elevation.

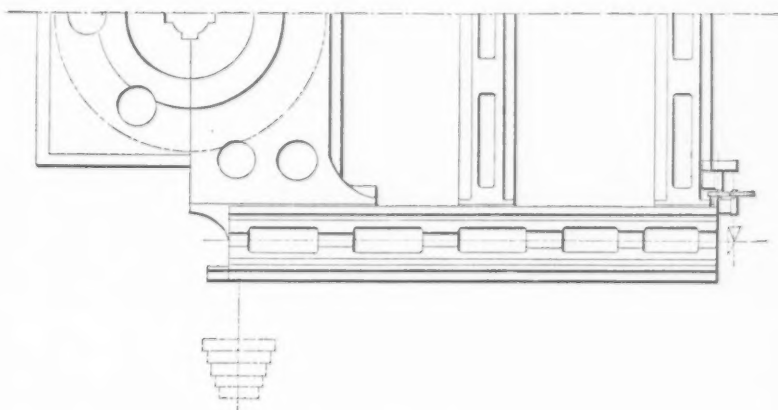


Fig. 5.—Half Plan.

THE BETTS 14-FOOT TURNING AND BOKING MILL.

Tin Plate Company, for the manufacture of tin plates. The works are to be located, we are informed, in the northwest section of Philadelphia, with offices at 200 Walnut place, that city. Mr. Phillips informs us further that the company have placed an order for machinery, Morewood pots, &c., with R. S. Newbold & Son, Norristown, Pa., and that they have one Jenkins and one Edwards automatic tinning machines *en route* from England. He also states that they have one Leyshon machine now ready for use. It is the expectation of the company to have all the machinery mentioned on the ground, buildings finished and plates on the market by November next.

defined policy, having in view the development of the domestic shipbuilding industry and the revival of the prosperity of the French mercantile marine. The construction bounties were authorized without any limitation as to the length of time the provision establishing them should continue in force; the navigation bounties were to be paid for a period of ten years only. By special enactment the latter, so far as regards French-built vessels, have been continued temporarily in operation since the expiration of the ten-year term, pending final decision as to the details of a similar law which it is proposed to put in force for a further definite period. The matter has been under consideration from time to

ments for supplying ammunition, and a tank capacity sufficient to insure a supply of fresh water for 100 men during one month.

The main features of the measure adopted in 1881 having been given, the question presents itself, To what extent has there been a fulfillment of the bright expectations then engendered? While it is difficult to arrive at an exact estimate of the results by the study of statistics, owing to the many elements which enter into any question of commercial and industrial development, there would seem to

sels making oversea voyages, while the figures which have just been given include all classes, thus comprising a large amount of tonnage which was not affected directly by these bounties, such as shipping employed in European commerce or in regular service on specially subsidized routes or in the domestic coasting trade, the latter being reserved, however, to vessels under the French flag.

Taking steamers only, and leaving out of consideration all those receiving subsidies for maintaining a prescribed service on certified routes, and therefore excluded by

and the proportion of this commerce falling to French vessels decreased somewhat during the same period.

The provision authorizing the payment of a premium of 15 per cent. in addition to the usual navigation bounty in the case of steamers built to meet special naval requirements has been almost entirely barren of results. The object in view was a very important one, but no nation has yet succeeded in securing a material increase in the number of her merchant steamers really suitable for employment as auxiliary cruisers or as transports in time of war

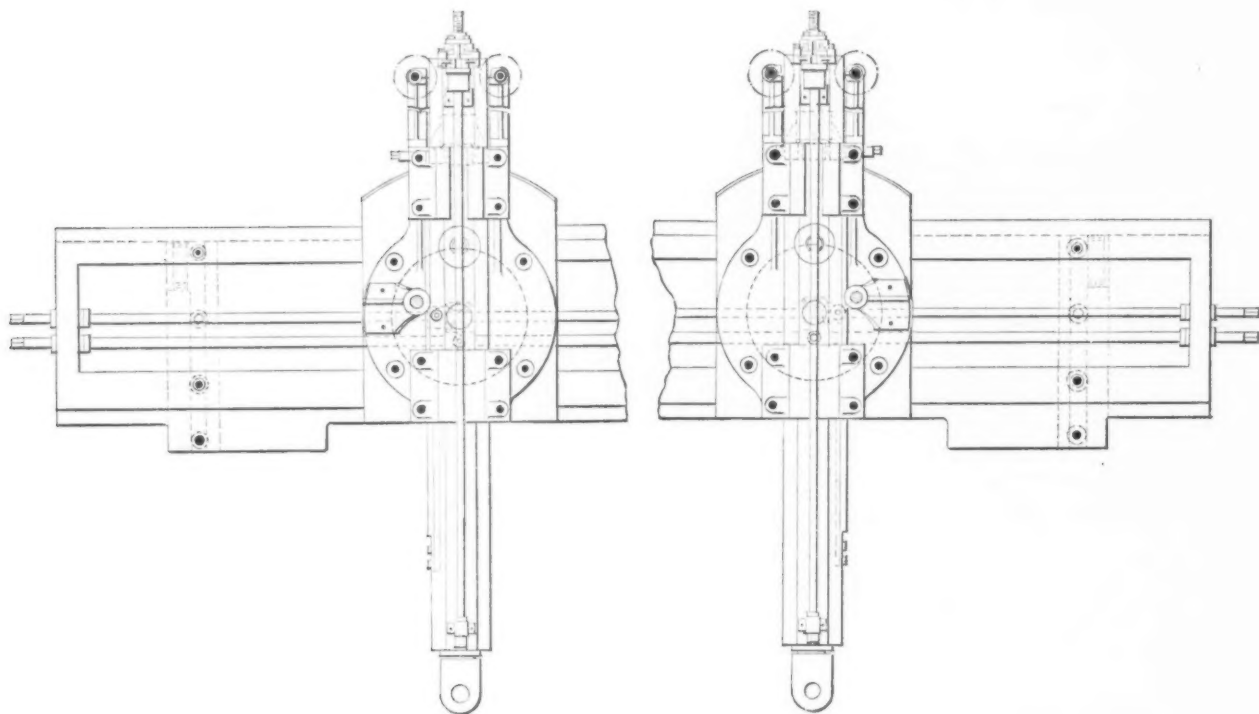


Fig. 6.—Front Elevation of Cross Rail and Saddles.

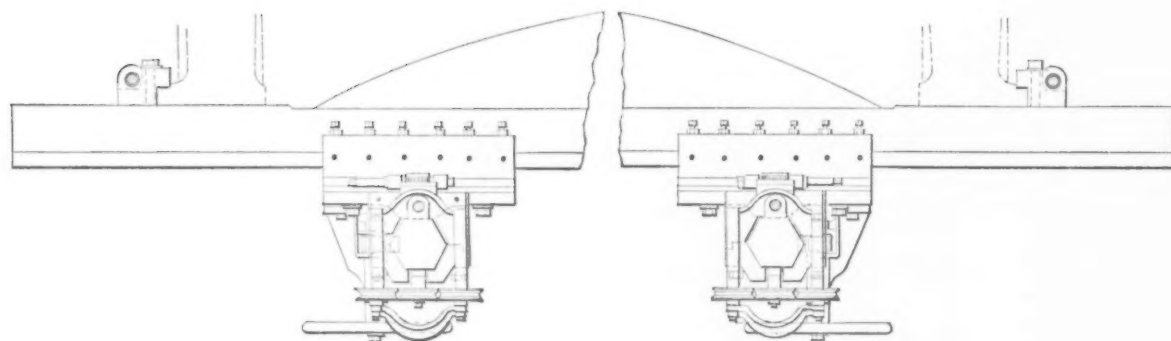


Fig. 7.—Plan of Fig. 6.

THE BETTS 14-FOOT TURNING AND BORING MILL.

be room for but little doubt that the navigation bounties, involving an average annual expenditure of about \$1,440,000, have played an important part in increasing the total number of steamers under the French flag from 652, with an aggregate tonnage of 277,759 tons, in 1880, to 1110, with an aggregate tonnage of 499,921 tons, in 1890. During the same period the total number of sailing vessels under the French flag decreased from 14,406, with an aggregate tonnage of 641,539 tons, to 14,000, with an aggregate tonnage of 444,092 tons; but a decrease in sailing tonnage is to be expected under present conditions of maritime commerce. The net increase, sail and steam, amounted to 52 vessels and to 24,715 tons. But the navigation bounties are paid only for ves-

sels making oversea voyages, while the benefits of the navigation bounties, the number of other French steamers of more than 1000 tons each, gross measurement, increased from 47, aggregating 72,985 tons, in 1881, to 215, aggregating 380,433 tons, in 1891.

As regards the development of new routes, it is noteworthy that while in 1881 there were but two routes on which regular and steady service was maintained by French steamers engaged in bounty-earning navigation, there are now 19 such routes.

The share of the French flag in the oversea trade of the nation increased materially from 1880 to 1890. The carrying trade of France with other European countries was not covered by the law of 1881,

without offering to pay adequately for it in one form or another. The first cost and the running expenses of such steamers being greater than is the case with other types, while the earning capacity is frequently less, private capital will not be invested in them unless inducements are offered sufficient to insure a satisfactory return for the outlay. The bid of the French Government was not high enough, and the law of 1881 caused but two steamers to be built to meet the naval requirements already noted. This feature of the law having practically failed to accomplish the results intended, it is now proposed, as will be seen presently, to increase the 15 per cent. premium to one of 25 per cent., but it is open to question whether even this will be sufficient. There are under

the French flag, available for Government use in case of need, a number of merchant steamers specially designed for employment as auxiliary cruisers and thoroughly suitable for the purpose, but they exist only as the result of liberal subsidies, the payment of which is a matter entirely distinct from the bounties here under consideration.

Turning now to the attempt to aid the development of the shipbuilding industry by the payment of construction bounties, it may be said at once that the results have not been at all satisfactory. The reason is simply that vessels can be built more cheaply and more quickly in England than in France. The British shipbuilding establishments, under the spur of keen competition among themselves, have been able to reduce the cost and the time of ship construction very materially, this having been achieved by more perfect organization, increase of resources, enlargement of plant and facilities for doing all kinds of work, as well as by cheapness of material. While steamers cannot be built in France at a less average cost than about \$80 per gross ton, they can be built in England for somewhat less than \$60 per gross ton, and a construction bounty of \$12 per ton is not sufficient to turn the scale in favor of the French builder.

The shipbuilding bounties paid in France from 1881 to 1890, both inclusive, amounted to nearly \$5,200,000. During this period there were built in French shipyards for the mercantile marine 455 steamers, aggregating 310,351 tons, gross measurement, and 6945 sailing vessels, of 118,554 tons, making a total of 428,905 tons. The amount of shipping procured abroad during these ten years for registry and employment under the French flag was 439,828 tons, this total being made up of 354 steamers, of 334,912 tons, and 732 sailing vessels, of 104,916 tons. Going more into details, it may be noted that of the total tonnage built in France 307,626 tons represent iron or steel steamers, of which 124,000 tons were for subsidized lines and had to be built at home to comply with the legal requirements, while the remaining 183,626 tons may fairly be ascribed to the influence of the Government bounties. Of iron sailing vessels about 22,000 tons were built in France, and over 49,000 tons, or more than twice as much, were built or purchased abroad for French ship owners. Of wooden sailing vessels a little more than 96,000 tons were turned out by French builders, as against something over 55,000 tons imported from abroad, but those built in France were mainly small fishing vessels.

Taking all the steam tonnage engaged in bounty-earning navigation under the French flag, the proportion built in France increased considerably under the operation of the law, but steam tonnage of foreign origin continued to be added, although earning only half bounties. The new steam tonnage seeking employment in this class of navigation, after the system had been fully inaugurated, was drawn about equally from foreign and French shipyards.

To sum up, it may fairly be claimed that the navigation bounties have been moderately successful, but it is clear that the construction bounties were fixed at too low a rate to keep out foreign competition. It is generally believed in France that the law of 1881 was the chief factor in arresting the decline in the amount of tonnage under the French flag, but at the same time it is universally conceded that the law did not accomplish the great results expected in this direction. It is apparent also that it has fallen far short of fully achieving its purpose so far as the shipbuilding industry is concerned, and if French statesmen were to adopt the advice of their neighbors across the Channel they would abandon the attempt to foster this

industry and would yield their acquiescence to the idea of depending upon British shipyards as the main source of supply of new tonnage for the French merchant marine. Vessels would then be purchased in the cheapest market, and the Government would besaved a considerable outlay. But the view held in France is that the private shipyards, in affording facilities additional to those of the naval yards for the construction of ships of war, constitute an important element of the national military resources. Another consideration deemed of importance is the employment afforded to large numbers of workmen, not only in the actual building of ships, but also in the industries supplying material. For these reasons, with perhaps an added element of national pride, public opinion in France seems to be generally favorable to a renewal of the effort to establish French shipbuilding on a firm and satisfactory footing, the belief being prevalent that the principles on which the law of 1881 was based are sound, and that the policy which it embodied is worthy of further trial, though modifications are evidently necessary in various details.

In order to gain a clear idea of the present status of the bounty question in France, it will be necessary to review briefly the recent history of the movement. In 1890 it became necessary to take some step in the matter, as the provisions of the law of 1881 authorizing the payment of navigation bounties would expire by limitation in the following January. At the same time it was desired to postpone final action until after the expiration of certain treaties of commerce. A measure was therefore adopted which provided that, with the exception of the half-bounty feature, the system already in operation should continue in force until January, 1892. The adoption of a new tariff law increasing the duties on materials entering into ship construction led to a further extension until July 31, 1892, in order to allow time for the preparation of a bounty law taking due account of these changes. Early in 1892 such a measure, having received the approval of the Minister of Commerce, was submitted to the Chamber of Deputies, and was referred to a committee charged with the consideration of the matter. This bill, so far as it related to bounties, was substantially a reproduction of the law of 1881, except that the amounts allowed for the construction of wooden vessels and for machinery were to be increased considerably. It was laid aside by the committee after an exhaustive inquiry into the whole subject, and a new project was reported back to the Chamber. As it was evident that the scheme advocated by the committee would involve a marked increase in expenditure, the antagonism of the Minister of Commerce and of the Budget Committee was aroused, the result being that the law already in force was again temporarily extended, and is now to remain in operation until January 31, 1893. A compromise measure was afterward reported by the committee, and upon it will be based the discussion of the matter in the Chamber of Deputies this autumn, when it is expected that decisive action will be taken.

The measure first reported by the committee provided for construction bounties and for navigation bounties, some new features being introduced. The construction bounties, to be paid for the building of merchant vessels in France, whether for foreign or for French owners, were to be largely in excess of the old rates in the case both of iron and of wooden vessels. For the construction of iron or steel steamers, for instance, there was to be paid \$23 16 per ton, gross measurement, or double the former rate. For boilers and machinery a bounty of \$2.90 per 100 kg. (equal to \$1.31½ per 100 pounds) was fixed upon. Certain allowances were

to be made for steamers rebuilt so as to increase their size, and also for renewal of boilers. Turning now to the navigation bounties recommended by the committee, there is to be noted an extension of their scope so as to include French vessels engaged in European commerce, a class excluded before; with this exception these bounties were to be restricted to over-sea navigation in the same manner as under the old law. There is also to be noted a reduction in the rate of bounty to be paid per ton for every 1000 miles run, the object in this reduction being to permit an increase in the construction bounties without taxing the public treasury unduly. It was, however, recommended that the navigation bounties should be calculated on the basis of gross tonnage instead of net. Vessels built in France and engaged in over-sea or European navigation were to receive, for every 1000 miles run, 19 cents per ton if steamers or 24 cents per ton if sailing vessels; these rates, being for new vessels, were to be subject to an annual decrease, varying in amount for the different classes. For steamers meeting the special naval requirements a premium of 25 per cent (instead of 15 per cent.) was to be added to the ordinary navigation bounty. Vessels built abroad can be admitted to French registry, and such vessels were to receive one half the usual navigation bounty; this provision of the old law was inserted, although vigorously opposed by French shipbuilders, who had succeeded in having it suspended when the old law was temporarily continued in force. A recommendation was made that 4 per cent. of the total amount of every bounty should be retained to form a fund for the relief of shipwrecked French mariners and their families.

The committee's bill as reported to the Chamber contained a clause providing that the new law should be operative for ten years, but the important feature was incorporated that a vessel beginning to earn a navigation bounty at any date during this period might continue to enjoy the benefits of the law for ten years from such date.

The compromise measure afterward reported by the committee is drawn on the same general lines as the earlier one, the salient features of which have just been noted, but the figures are modified somewhat. Thus the construction bounty for iron or steel steamers is fixed at \$17.37 per ton, gross measurement, this being an increase of 50 per cent. on the old allowance. The navigation bounty is still placed at a lower rate than that of the old law, but at a higher one than was originally suggested by the committee, the rate now proposed for the full bounty in the case of new steamers being 21.2 cents per ton, gross measurement, for every 1000 miles run, with an annual decrease. The half bounty provision still appears, as does the one allowing for steamers built on plans previously approved by the Navy Department a premium of 25 per cent. on the navigation bounty. The extension of the navigation bounties to vessels engaged in European trade is retained, but for such vessels the rate is to be only two-thirds as much as for over-sea navigation, and a minimum distance of 120 miles between a French and a foreign port is requisite. The portion of the navigation bounty to be reserved for the benefit of sufferers from shipwreck is reduced somewhat. Except as noted the compromise measure remains substantially the same as the one first reported by the committee.

To go more fully into the details of the committee project, either in its original or in its later form, would be of doubtful utility at the present time, since many modifications may be made when the question again comes before the Chamber of Deputies. Current discussion in French journals indicates that the shipbuilders

will probably endeavor to have the half-bounty feature stricken out and the construction bounties fixed at the figures recently proposed by the committee, while the shipowners will be apt to exert their influence to have the navigation bounties fixed at the rates established by the old law, including the retention of the half bounty. At the same time, it is to be expected that there will be strong opposition to proposals which involve any great increase in expenditure.

The Tilting Open-Hearth Furnace.

For two years the Pennsylvania Steel Company have had in use two 15-ton tilting open-hearth furnaces, designed by Henry Aiken of Pittsburgh, F. W. Wood, president of the Maryland Steel Company,

occurred of about \$72,000, caused mainly by the strike in the Durham coal trade, which suspended work at the steel works and blast furnaces and created larger costs in the completion of two Government cruisers. At the present prices of metal there is no profit in building ships.

The Vermillion Range.

Besides the development of the Mesaba range there promises to be a very marked increase in activity on the neighboring Vermillion. The mines of the Minnesota Iron Company, at Soudan, 90 miles north of Duluth, this year shipped 500,000 tons, and the far-famed Chandler, at Ely, also belonging to the same corporation, will increase this amount to 1,200,000 tons.

years to the big Minnesota Company, and it will be operated largely next year also. These are both hard-ore mines, and there is not a little comment on these leases after the discovery of the soft and easily mined ores of the Mesaba. As a matter of fact, however, these mines are all of higher grade than any of the Mesaba ores yet uncovered, and the Vermillion people claim that they will not be troubled by the cheaper ores when they can continue to show such cargo assays and furnace results as at present.

Just north of the Chandler is the Pioneer, which has been operated in a desultory sort of way for two years. It is owned by Senator Spooner of Wisconsin, J. A. Humbird of Hudson, Ogilby, Norton & Co., and Capt. Thos. Wilson of Cleveland, and others, the Cleveland parties buying in this summer. The Chand-

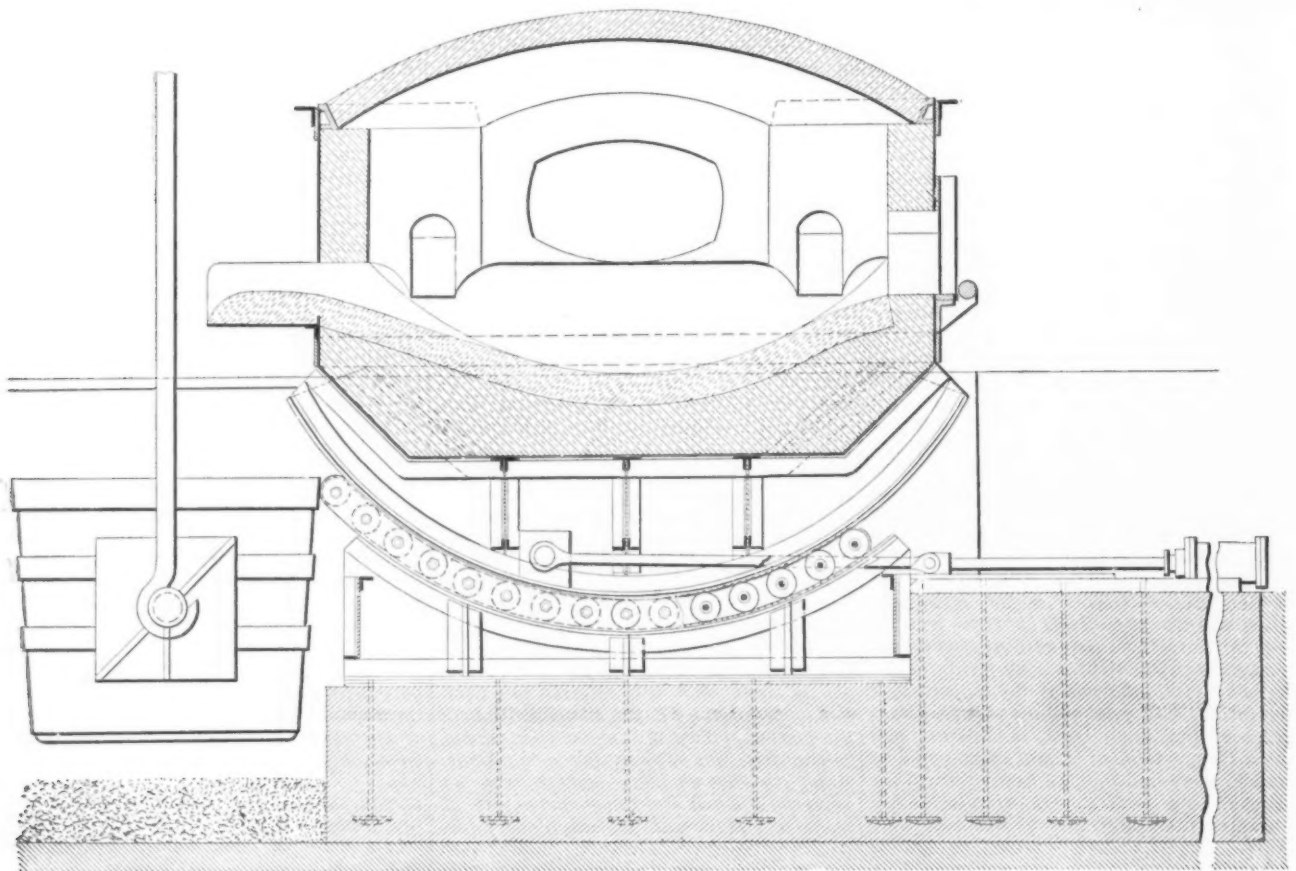


Fig. 1.—Cross Section.

THE TILTING OPEN-HEARTH FURNACE.

and Harry H. Campbell of the Pennsylvania Steel Company, Steelton, Pa. A glance at the accompanying drawings will suffice to show its characteristic features. The furnace is provided with rocker bars resting in a series of anti-friction rollers set between the lateral confining plates of curved rails. The tipping of the furnace is done through the medium of a hydraulic cylinder, indicated in Fig. 1, provided with a cross head and connected by links with the rocker frame of the furnace. The principal advantage of the design is that the hard work at the tap hole is avoided, and that the pouring of the charge is under control. A number of furnaces of this design have also been put in for copper matting at the new works of the Boston & Montana Company, at Great Falls, Mont.

The annual report of the Palmer's Shipbuilding Company, in England, shows that during the last half year a net deficit

This year also, a slight business has been done by the Pioneer Mine at Ely, and the Zenith has been added to the list of shippers and has sold to furnaces 20,000 tons, which is now being delivered. For 1893, however, the Minnesota Company plan extensive new workings. Not only will the mines at Soudan (Tower) be operated largely, and the Chandler pushed, but three new properties will be opened and mined to a large extent. The Minnesota Company have just closed a lease of the Miller and Brown 80-acre tract, lying close by the Chandler, and will, so it is stated, mine therefrom at least 100,000 tons. This property has been exploited by diamond drill, and is claimed to be as rich in grade and to contain as much iron as any other tract of its area on that range. Work preparatory to mining will begin at once. A few miles east of Ely, on Armstrong Lake, is the Macomber Mine, on which no little development work has been done in the past two years. This is about to be leased for a long term of

ler ore body, a vein of soft, high-grade iron, passes into this property at a depth of about 800 feet. Work began this week on a fourth compartment shaft, 7½ x 22 feet in size and 800 feet deep, by which the Pioneer people expect to reach the Chandler body. It will be fitted with three 10-foot hoisting drums, air-compressing machinery and a large pumping plant, and will be in position to hoist at least 200,000 tons in 1893. The deepest shaft in the Chandler at present is 450 feet, and as the new Pioneer shaft will drain the older mine, a powerful pumping plant will be needed. The Chandler pumps now take care of about 600 gallons daily.

The Chandler Mine itself, which has the reputation of having raised more ore from one 40 acre tract than any mine in existence, will this year send forward 650,000 tons and perhaps more. It is now operating on 80 acres. The South 40, which for four years sent out an average of over 300,000 tons annually, is now furnishing only about one-third the ore mined. The

bulk of the work this season has been on the North 40. This mine is a leasehold, and pays a royalty of 30 cents per ton. It is asserted that the net profits to the mining company are fully \$1 per ton. The feehold of this mine is owned in Duluth and Saginaw, and the lease is held by the Minnesota Iron Company.

Regarding the statement above, that the ores of the Vermillion are of a higher grade than those of the Mesaba—so far as yet opened, at least—the reports from a couple of cargo assays of the Zenith may be in point. Assayed in Cleveland, one cargo went 65.19 iron and 0.013 phosphorus, another 64.80 and 0.036; a third 64.03 and 0.018. These are not so good as the higher guarantees of the Minnesota, but they will do very well for a new mine, and are probably ahead of anything the

who understands the methods employed in introducing new machinery in the Western States, viz.: Plows, cultivators, harrows, hand drills, feeders, fanning mills, feed cutters, spraying apparatus for orchards and vineyards, horse-tread powers, windmills of all styles, dog carts, wagons, carriage and buggies. He adds that the laws for the collection of debts are all in favor of the creditor, and as a rule the Spanish dealer has a high sense of honor and is perfectly safe. Notes can always be discounted at 4 or 5 per cent. in the local banks.

The Foundrymen's Association.

The seventeenth meeting of the Foundrymen's Association took place at the Manufacturers' Club, in Philadelphia, on

sire that he should not be re-elected to that post, on account of business exigencies which made it almost impossible for him to devote the necessary time to its duties; but on the urgent request of the members present Mr. Evans consented to reconsider his decision. Several speakers testified to the good work done by him in the arduous post of secretary since the organization of the association and his untiring efforts for its success, and pointed out that the loss of his valuable services at the present stage of its existence would be most serious and detrimental to its well-being in every way. The association is to be congratulated on the prospect of retaining Mr. Evans' services for another year at any rate.

As an illustration of the interest which the Foundrymen's Association has aroused,

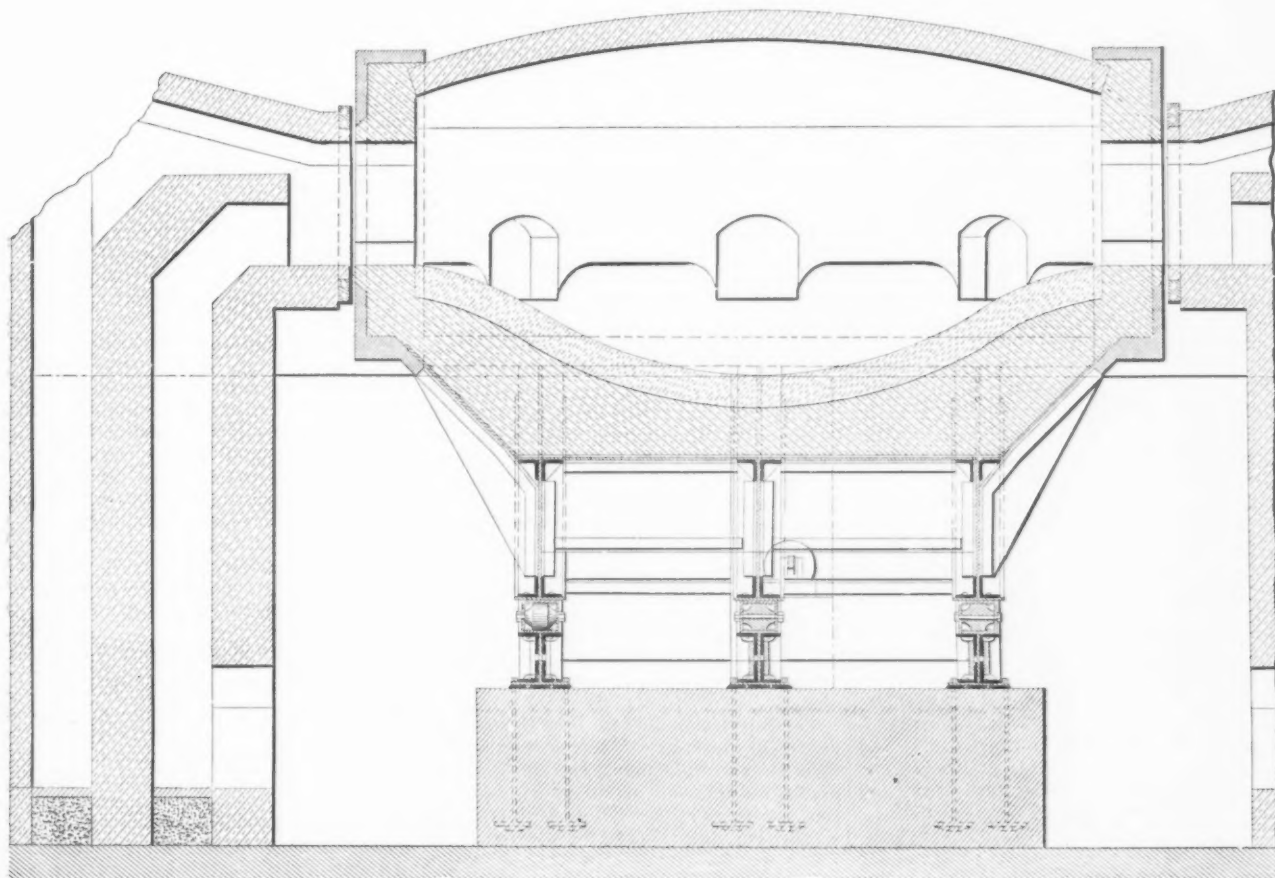


Fig. 2.—Longitudinal Section.

THE TILTING OPEN-HEARTH FURNACE.

Mesaba will be able to show for some time.

There are two or three other properties on the East Vermillion that may be operated next year in addition to those referred to above and to the mine of the Gunflint Lake Iron Company, lying 30 miles east of Ely and directly south of the international boundary, the product of which latter will go out through Canadian channels. Chief of these is the tract in 63-11, south of Ely, which is reputed to contain a greater showing of high-grade hard ore than any similar area in the world, and whose hotly contested title suits have brought scandal uncomfortably near the seat of the Secretary of the Treasury. This will be opened and can easily be a producer of 500,000 tons annually as soon as the question of ownership is settled.

Consul Turner, at Cadiz, reports to the State Department that the following American agricultural implements might be introduced in Spain, if urged by a man

Wednesday evening, October 5, a large contingent of members being present. The chair was taken by President Francis Schumann, and after the routine reports from the secretary the principal business of the meeting was proceeded with, viz.: the nomination of officers for the ensuing year. The following names were presented unanimously, viz.: President, Francis Schumann, of the Tacony Iron and Metal Company, Tacony, Pa.; vice president, Thomas Devlin, of Thomas Devlin & Co., Philadelphia; treasurer, Josiah Thompson, of J. S. Cassin & Co., Philadelphia; secretary, Howard Evans, of J. W. Paxson & Co., Philadelphia. For Executive Committee, Walter Wood, of R. D. Wood & Co., Philadelphia; Thos. Glover, of Glover Brothers, Frankford, Philadelphia; L. B. Whitney, of A. Whitney & Sons, Philadelphia; A. C. Vansant, of Morris, Tasker & Co., Incorporated, Philadelphia, and Stanley G. Flagg, Jr., of Stanley G. Flagg & Co., Philadelphia.

Mr. Evans tendered his resignation of the office of secretary, and intimated a de-

it may be mentioned that the Secretary of State has volunteered to obtain from the United States consuls in Great Britain, France and Germany all the information they can collect in regard to foundry practice, prices, wages, &c., in those countries, and, by his desire, a list of questions to be answered by such consular officers has been prepared by the Executive Committee of the association and forwarded to the State Department accordingly. It is hoped that much useful information may be thus secured.

The association has during the initial year of its existence already accomplished a large amount of good in the lines on which it was founded, viz.: the advancement of the foundry trade in the United States. A mass of valuable information bearing on the business has been gathered from various sources, which will prove of great value to foundrymen in general, and much benefit has accrued from the ventilation of matters of interest to the trade in the meetings of the body.

The association now numbers about

100 members, and, as it is national in character, it is hoped that many more from all parts of the country may join its ranks and thereby benefit themselves and the foundry industry in general, by associating for mutual protection and the advancement of the foundry interest.

The address of the secretary of the Foundrymen's Association is, Care of J. W. Paxson & Co., Pier 45, North Delaware avenue, Philadelphia, Pa.

WORLD'S FAIR NOTES.

The Battle-Ship Exhibit.

But a small part of the population of this country can ever be favored with a view of a genuine battle ship. The residents of the interior are just as much interested as those on the seaboard in the preparations made by the United States Government to defend itself through the navy. They would like to see a battle ship of the formidable type now in use. It would have been impossible to send one to Chicago to be shown to visitors to the fair. So Commodore Meade of the navy made a suggestion that a model be built in order to show as nearly as possible what one of these monsters looks like. It is now about completed and is called the "Illinois." It is built in shallow water, so that it appears to be afloat. F. W. Grogan, a naval architect connected with the construction bureau of the Navy Department, is the designer of the "edifice." Mr. Grogan had much to do with the designing of the real battle ships "Indiana," "Massachusetts" and "Oregon," and hence it was not a difficult task to design the show ship for the exposition. But there were difficulties in the way. The bogus ship had to be built partially on land. Mr. Grogan couldn't lay any keel. He could not put in any keelson plates or set up any frames. He had to mark out the contour of his ship at some point near the beginning of the swell of her bilge and there start an oval brick wall in the sand. The laying of bricks is not a part of a naval education, and this gave Mr. Grogan some annoyance. But Grogan and the contractors got along all right, and the result of their joint efforts to-day stands out as one of the most novel and interesting attractions at Jackson Park.

The World's Fair battle ship has the same dimensions as the original. She is 348 feet long on the water line, 69 feet 3 inches extreme breadth amidships and has 14 feet freeboard—that is, 14 feet above the water line. Her battery will be precise models of the genuine guns—viz.: Four 13 inch breech loaders, eight 8-inch breech loaders, four 6 inch breech loaders, 26 pounder rapid-fire cannon, six 1 pounders, Galing guns, &c. All but the two heavier grades of ordnance will be genuine guns from the Washington gun foundry. The 13 and 8 inch guns must of necessity be models, being too heavy to mount in such a structure, but all the other guns will be genuine, and, with their mounts complete, will form an instructive exhibit. The big guns will be models, but they will be mounted and worked just as the originals. They are made of first a wooden frame work, this covered with wire lathing and then the cement put on. The models are striking, and unless touched with the hand the delusion is perfect.

The materials in the battle ship are brick, steel, wood and cement. The latter enters largely into the construction of the affair. As has been said, the sides or hull portion of the structure from the main deck is built of brick, stepped to give contour, set into a thick layer of concrete, finished outside and inside with cement and shaped accurately to the lines of the vessel. Finish is given by iron

plates conforming to the shape of the vessel, extending downward below the water level, so that at no time will the foundation be exposed.

The superstructure, which is sometimes called the citadel, rests upon the main deck between the 13-inch gun turrets. Its sides are of wood covered with metal lathing and cement. All the decks, beams, bridges, &c., are to be of steel, and these, with other portable things, will be used later in the real battle ships. The guns of the 13-inch caliber are to be mounted in Hichborn turrets, with redoubts extending down through the main deck and resting upon the berth deck. The 8 inch guns are mounted at each corner of the superstructure, in pairs, in Hichborn turrets. The 6-inch guns—the genuine article—will be mounted in sponsons on the main deck. The military tower is of iron and located at the forward end of the superstructure, near the upper part of which are the military tops for quick-firing guns. In the base of the military tower is the conning tower, where the commanding officer stations himself in battle. The conning tower will be fitted with all facilities, speaking tubes, electric bells, telephone, steering machinery, indicators and everything needful for a captain to have in a fight, except, perhaps, a locker for "Dutch courage." The bridge is above and extends the whole length of the superstructure in the center line of the vessel. On the forward end of the bridge is the charthouse. Distributed along the sides of the bridge will be Hotchkiss guns and powerful search lights. Outside the bridge are stowed the boats for sea service and fighting, supported by "skids" of steel. The boats are handled by powerful iron cranes, manipulated by steam winches. On the decks and along the sides of the ship are all the fittings, such as anchors, chains, davits, winches, windlasses, capstan bits, wire hawser reels, nippers, skylights, life buoys, side ladders, swinging booms, canopies, awnings, &c., and stretched along the side, extending the entire length of the vessel, there will be a huge torpedo net, with all the boom and block attachments, to show the manner of protection against torpedo attacks.

The interior of the hull is to be a perfect battle ship interior. There will be a complete electric light plant, and as it is expected that officers, sailors and a full marine guard will be detailed during the Exposition the superstructure has been fitted up for living quarters, in which may be seen cabins, staterooms, lavatories, latrines, messrooms, galleys and fittings, mess tables for crew, lockers, berthing, and all quarters in which the officers and enlisted men live according to the rules of the United States navy. On the berth-deck will be shown the stowage of ammunition in magazines and shell rooms, the lighting and flooding of same; the handling of ammunition and manipulating of torpedo tubes, turrets, &c.; the various fittings pertaining to machinery, ordnance and implements, including electrical devices, gun carriage motors and range finders; charts and instruments of navigation; models showing the type of vessel of the past and present; samples of provisions, clothing, stores and supplies, bunting, flags—in short, the thousand and one things that go to make up the outfit of a ship of war.

Then a large portion of space will be given up to historical exhibits, in which the navy is so rich. At the various navy yards throughout the country and at Washington there are enough curios to sink a bigger ship than the "Illinois." At Washington alone there are the rarest things. At New York and Boston there are countless relics of the early days of the navy. The choice of all these things is to come to the naval exhibit, and all will be placed on two great decks. There

will be portraits of every naval hero from Paul Jones to Farragut, including such men as Bar on, Decatur, Old Ironsides, Stewart, Perry, Lawrence, McDonough, David Porter, of "Essex" fame, and winding up with the men of the civil war—Farragut, Goldsborough, Foote, Dupont, Lee, C. H. Davis, Young, Cushing, Ward and hosts of others. The traditional costumes of the sailors of the navy will be shown by janitors dressed in those costumes, who will be specially engaged for that purpose. Each bureau of the Navy Department will have an officer and other representatives in control of its special exhibit and the hydrographic office, intelligence office and naval academy will be also represented. The structure itself will closely counterfeit the latest type of man-of-war above the water line. Steam launches and cutters will ride at the booms and all the outward appearance of a real man-of-war will be imitated. This last, however, depends somewhat upon the shifting sands.

The captain's quarters, officers' ward-room and the quarters of all on board will be fitted and furnished just as the "Indiana" will be. The furniture will be used on one of the genuine ships. As these quarters will be elegant and right on the fair grounds, it is not surprising that assignments to the new ship are being eagerly sought by the navy people. It is understood that the "Illinois" will have a complement of 10 officers, 100 sailors and 50 marines. They will be the picked men of the service.

Altogether the work of the naval architect and the contractors has proved a wonderful success. There were many misgivings when the project was first discussed. Meade's "tin battle ship" was made all manner of fun of, but, thanks to Mr. Grogan and Contractor Gindele, who, by the way, never saw a salt-water ship, the work has been admirably done. It will be one of the most distinguishing features of the fair. The ship already is such an object of curiosity and interest that all visitors are rigorously excluded.

Designs for Medals and Awards.

A conference was held at the Treasury Department in Washington, on the 5th inst., in which Assistant Secretary Nettleton and Chief Meredith, of the Bureau of engraving and Printing, representing the United States Government, and J. Boyd Thacher, General Sewell, A. T. Britton and General Andrews, the Committee on Awards of the World's Fair, participated, to decide upon the form of diploma to be made in making awards. The text of the diploma was practically agreed upon, but the conference decided to request Mr. Low, a New York artist, to submit a design. One design has been prepared by the Bureau of Engraving and Printing, and from these two Assistant Secretary Nettleton was authorized to make a selection of the most suitable one. The same committee also conferred with Director Leach as to the design for the medals, of which 50,000 are to be struck. It was decided that Director Leach enter into an agreement with St. Gaudens, the New York sculptor, to prepare the design in accordance with the ideas of the Secretary of the Treasury and the Director of the Mint.

Must Have Another Building.

The machinery department of the World's Fair is about to begin the allotment of space. There remains in Machinery Hall, after foreign powers and the power plant have been accommodated, 220,000 square feet of space for American manufacturers. The demands from this class of exhibitors almost reach 1,000,000 square feet. In order that the United States may properly compare with foreign powers, and at the same time the individ-

ual interests of both large and small manufacturers be protected, the most careful cutting down of space requested by exhibitors must be made. If the space at the disposal of the department will accommodate only one-fifth of the exhibitors that have applied, the manufacturers of the country should understand the situation as it actually exists and feel that they must send only their representative machines, leaving out everything in the nature of duplications, or that can be explained by catalogues.

Chief Robinson has tried to arrange for space for certain exhibits outside of the building, but so far unsuccessfully. He now intends to ask that a separate building be erected between the boiler house and the saw-mill building along the railroad tracks. If this is granted he will place in it brick, terra cotta and tile machinery, as well as forges, blowers, grates and other boiler appliances, drop hammers and machines for special forging, as well as machinery requiring the use of fire.

Educators Gain their Point.

The educational building is now assured. The Executive Committee have authorized the Council of Administration to get plans at once for a building with 150,000 square feet of space on the ground floor, and to furnish with the plans an estimate of the cost of the building. It is probable that 50,000 square feet in addition will be provided in the gallery, thus giving the educational interests all the room they want for a complete collegiate and school exhibit. The decision to put up a building for the educational section of the fair goes a long way toward relieving the pressure for space in Manufacturers Hall. Dr. Peabody will have more room for other features of his liberal arts display; Professor Putnam may get back part of the space that Colonel Davis took away from the department of ethnology, and Chief Allison may get some more room for manufactures.

Too Big for Ocean Steamers.

There are grave doubts about the 124-ton Krupp gun being on exhibition at the World's Fair. It is true, as stated by World's Fair officials, that the Pennsylvania Railroad Company are preparing specially constructed cars that will transport the weapon, but the agents of the Krupps in this country say that it is not settled that the company will send the gun. They have found difficulty in arranging for its transportation across the water, and it is thought by army ordnance officers to be by no means certain that this mammoth piece of ordnance will be exhibited here.

Mexico Grows Enthusiastic.

In spite of the fact that Mexico has abandoned the project of having a building the exhibit from that country will be a notable one. The Department of Public Works at the City of Mexico has received partial reports from the local boards in the various States of the Republic. All these reports show that the Mexican exhibit will be as complete as the one that nation had at the Paris Exposition. The State of Sonora will send a fine collection of minerals. Not to be outdone, the State of Gereco has collected a large exhibit of ores and hard woods. Lower California will send specimens of medical plants and a collection of pearls. Nuevo Leon will display wines, cloth and flour, also a collection of ores and woods. The States of Oaxaca, Puebla and Hidalgo are making collections. In minerals it is expected that Zacatecas and Guanajuato will excel their former exhibits, which were so much admired at New Orleans and Paris.

Miscellaneous.

Edward Broart, the French commissioner, writes Director-General Davis that the most prominent merchants of Nice, France, have decided to take part as a unit in the World's Fair, and have organized a syndicate which is willing to build a magnificent pavilion for the exhibition and sale of French products of that region. The French Commissioner-General fully indorses the project, and requests that the application be granted. He suggests that if the lack of space will occasion any difficulty, a space be reserved for the Nice pavilion on the lot assigned to the city of Paris.

The Department of Transportation Exhibits is informed that John Phillipson, who is the head of one of the oldest carriage-building firms of Newcastle, England, has consented to loan to the World's Fair his unique collection of drawings, paintings and models that illustrate the development of locomotion on wheels during the last 50 years.

A contract for the temporary viaduct over the Midway Plaisance was awarded last week to McArthur Bros, who will do the work for \$9354. Westinghouse, Church, Kerr & Co. secured a contract for a 330 horse power engine. A contract for steam pipe was awarded to J. B. Clow & Son for the sum of \$6059, and the Addyston Pipe & Steel Company will supply \$4133 worth of hydraulic pipe for the pumping station.

By the burning of the freight sheds of the Nickel Plate Railroad yesterday the car containing 75 typewriters to be used in the dedication ceremonies was totally destroyed. Another carload will be immediately shipped from New York.

A model of the Chignecto Ship Railway will be exhibited in the Canadian section of the transportation exhibits.

Announcement is made that the recent decision of the United States Circuit Court of Appeals in favor of the Edison Electric Light Company, in which it was decided that to that concern belongs the exclusive right to manufacture the incandescent lamps, will not seriously inconvenience the Westinghouse Electric and Mfg. Company of Pittsburgh. The reason given for this statement is that the last-named concern has about ready for the market an incandescent lamp that it is claimed will revolutionize the world in electric lighting. For some time past three pots in the glass house of Atterbury & Company on the South Side, Pittsburgh, have been working exclusively on a lamp of an entirely new pattern for the Westinghouse concern. According to the decision given above, the Edison people have the exclusive right to manufacture incandescent lamps in which a high resistant filament of carbon is used, incased in a glass globe of special construction. The Westinghouse lamp will be constructed on what is claimed to be an entirely different principle. It will have a glass stopper instead of a porcelain stopper used by the Edison concern in the manufacture of their lamps. The filament will also be different. It is estimated that the cost of manufacturing the ordinary 16 candle-power incandescent lamps now in general use is about 36 cents. The exact cost of manufacturing the new Westinghouse lamp could not be ascertained, but it is claimed to be considerably less than the above figure. Some months since, when the contract for lighting the World's Fair was given to the Westinghouse concern, George Westinghouse, Jr., stated that his firm was prepared to fulfill their contract of furnishing the light to the World's Fair regardless of the decision of the court in regard to the Edison light. At that time the statement

of Mr. Westinghouse created considerable surprise, but the fact that his firm have an entirely new lamp about ready for the market thoroughly explains the position taken by Mr. Westinghouse when the claim was made.

Argentine Trade.

The foreign trade returns of Argentina for the first half of 1892 are just at hand. In imports and exports there is some improvement upon the low figures recorded for the first half of 1891, the imports showing an increase of 14 per cent. over that period, the exports 7 per cent., and the total trade 9 per cent.

The increase in total imports would have been much greater had it not been for a heavy falling off in the amount of railway material received. Practically all other articles imported were received in considerably augmented quantities, as may be seen from the following statement, which compares the values of the principal classes of goods imported in the two half years:

| | First half, 1892. | First half, 1891. | Increase or decrease in 1892. |
|------------------------|-------------------|-------------------|-------------------------------|
| Groceries..... | £1,310,000 | \$758,000 | + £552,000 |
| Wines..... | 498,000 | 380,000 | + 118,000 |
| Dry goods..... | 2,664,000 | 1,666,000 | + 998,000 |
| Lumber..... | 232,000 | 312,000 | - 80,000 |
| Hardware..... | 710,000 | 444,000 | + 266,000 |
| Coal, &c..... | 580,000 | 384,000 | + 196,000 |
| Railway materials..... | 392,000 | 1,710,000 | - 1,318,000 |
| Sundries..... | 1,164,000 | 986,000 | + 178,000 |
| Total..... | 7,580,000 | 6,640,000 | |

Thus, if no account were taken of the heavy falling off in railway material, the increase in total imports would have been not 7 per cent., but 50 per cent. The larger imports of such items as coal and iron and wire, showing increases of 50 per cent., 115 per cent. and 84 per cent., respectively, may be considered satisfactory in as far as they may be taken as evidences of reviving industry. This, however, cannot apply to the increased imports of wine, but in this the falling off last year was very heavy, the quantity received in the first half of 1890 being over 13,000,000 gallons. The imports of sugar have doubled, and this in spite of a 100 per cent. ad valorem duty. The export returns are disappointing, inasmuch as they show a falling off in wool and other items from which much was expected. Some cereals, however, have been shipped in much larger quantities, and there is a noticeable improvement in the preserved beef trade, for which improvement there was plenty of room. The following are the chief exports by quantity:

| | First half, 1892. | First half, 1891. | Inc. or dec. in 1892. |
|------------------|-------------------|-------------------|-----------------------|
| | Tons. | Tons. | Tons. |
| Wool..... | 103,600 | 111,400 | - 7,800 |
| Mutton..... | 12,500 | 11,300 | + 1,200 |
| Beef..... | 35,100 | 19,300 | + 15,800 |
| Wheat..... | 362,000 | 296,000 | + 66,000 |
| Maize..... | 119,000 | 26,000 | + 93,000 |
| Linseed..... | 37,800 | 5,600 | + 32,200 |
| Hay..... | 14,700 | 16,300 | - 1,600 |
| Tallow..... | 15,100 | 11,100 | + 4,000 |
| Sheepskins..... | 11,300 | 9,800 | + 1,500 |
| | No. | No. | No. |
| Cowhides..... | 1,730,000 | 1,850,000 | - 120,000 |
| Live cattle..... | 60,000 | 112,000 | - 52,000 |
| Live sheep..... | 28,000 | 61,000 | - 33,000 |

Thus the improvement this year in Argentine trade is scarcely coming up to the expectations of some. The customs revenue, however, for the half year is stated to have improved by no less than 81 per cent., being given as \$43,530,000 (currency) this year, against \$23,940,000 last.

America's biggest locomotive, just finished from new designs, was sent out last week from the Union Pacific shops at Omaha, Neb. The engine stands 15 feet 5 inches from rail to top of smokestack. The boiler is 5 feet in diameter and 23 feet 4½ inches long, with 252 2 inch tubes, each 11 feet 6½ inches long. An average pressure of 180 pounds will be carried.

Works of the American Tin Plate Company.

In view of the attention which is at the present time being given to the tin-plate industry in this country, a brief description of the works of one of the more important concerns engaged in the production of American tin plates cannot fail to interest our readers. The illustrations here presented show interior views in the works

separated. This structure measures 150 x 76 feet. The "cold-roll mill," constructed of brick and stone, and 130 x 60 feet in size, contains the boilers, cold-roll machines, pickling machines and annealing ovens. The tinning house and sorting room is a brick structure 170 x 50 feet in size. The three buildings constitute four mills at present, but are arranged for six, and will be enlarged, we understand, to this capacity within a comparatively short period. The works have five engines in

us, are heated to a cherry red in furnaces supplied with natural gas. They are then carried to hot rolls, passed through a number of times, are doubled and reheated and rerolled until the desired thickness and length is obtained of eight thicknesses, which is called a 'pack.' These packs then pass to the shearmen, who shear them up into various sizes—14 x 20, 20 x 28, 14 x 14, 10 x 10, and so on all through the many sizes used of tin and terne plates. After these packs are sheared

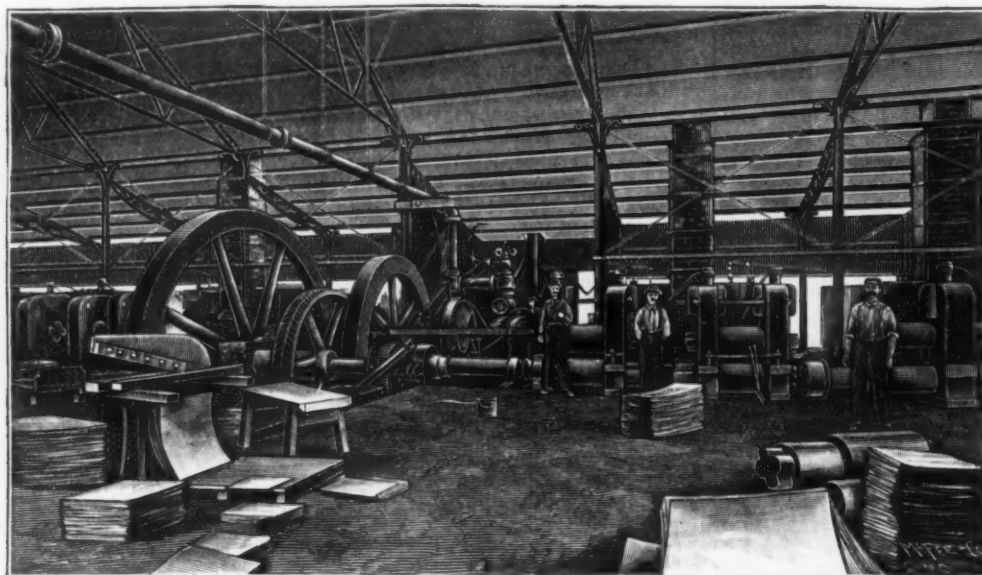


Fig. 1.—View in the Rolling Mill.

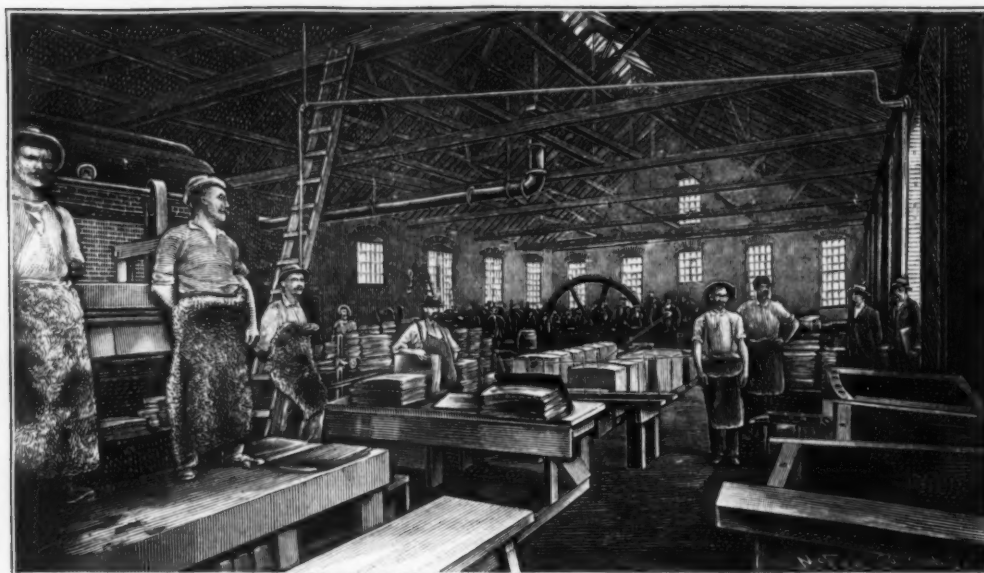


Fig. 2.—Cold-Rolling and Pickling Department.

WORKS OF THE AMERICAN TIN PLATE COMPANY.

of the American Tin Plate Company of Elwood, Ind., organized, we understand, September 10, 1891, with a capital stock of \$300,000. They own 10 acres of ground, located about half a mile from Elwood, and conveniently situated, with regard to water, drainage, switching facilities, &c. Active operations on the buildings were commenced November 8, 1891, and the work of completion pushed forward as rapidly as possible. We are informed that at the present time three structures are completed. The first of these, made of iron, is called the "hot mill," as it is the place where the black plates are heated, rolled, doubled and

constant use, the largest being of 1000 horse-power. The illustrations which we give represent views in the various departments of the works, Fig. 1 showing a portion of the rolling mill, Fig. 2 the cold-rolling and pickling department, Fig. 3 cold rolls and annealing boxes, Fig. 4 a view of the annealing furnaces, Fig. 5 the charcoal and coke plate tinning stacks, and Fig. 6 the terne-plate tinning stack.

From a little pamphlet which the company have issued relating to their plant we take the following description of the details of manufacture of tin plates in their establishment: "The Bessemer steel bars of various sizes, made especially for

they are passed over to the openers, who separate them into single sheets, after which they are sent to the pickling department, which also has in connection with it, in the same building, the annealing furnaces and cold rolls. The first process in this building is the pickling in a bath of sulphuric acid or black pickle. The sheets are then placed in large iron annealing pots, which are rolled into the annealing ovens and heated to a high degree by natural gas, these pots remaining in the ovens from 10 to 12 hours, after which they are removed and allowed to cool. The sheets are then passed through the cold rolls singly four times, after which

they are placed a second time in the annealing furnaces. After removal from this second annealing they are perfect steel sheets, ready for the second or white pickle, which removes all impurities and leaves the sheet perfectly smooth and ready for the tinning department.

"At this stage they are known as 'black plate,' about which so much has been said concerning imported black plate being received by us from abroad and simply dipped in molten tin and palmed off on the public as home-made tin plate.

sheepskin. The plates are ready now for the assorting, picking and shipping departments."

We understand the company are now giving employment to something over 200 hands, of whom 30 are boys and 30 are girls. It is stated that the present output of the works is 1200 boxes a week. The full capacity, however, with existing facilities, is about 2500 boxes per week, and it is expected that this quantity will be turned out in a very short time. The officers of the company are A. L. Conger,

will be erected, one containing the machine shop and the other the foundry, electric plant, &c. The contract for the erection of these buildings has been awarded to Riter & Conley of Pittsburgh, and their construction has already been commenced. The machine shop building will be of brick and iron and will be 100 feet wide by 250 feet long, and will be fitted up in a most complete manner. The equipment will consist of a 25-ton electric traveling crane, built by the Shaw Electric Crane Company of Muskegon, Mich., and

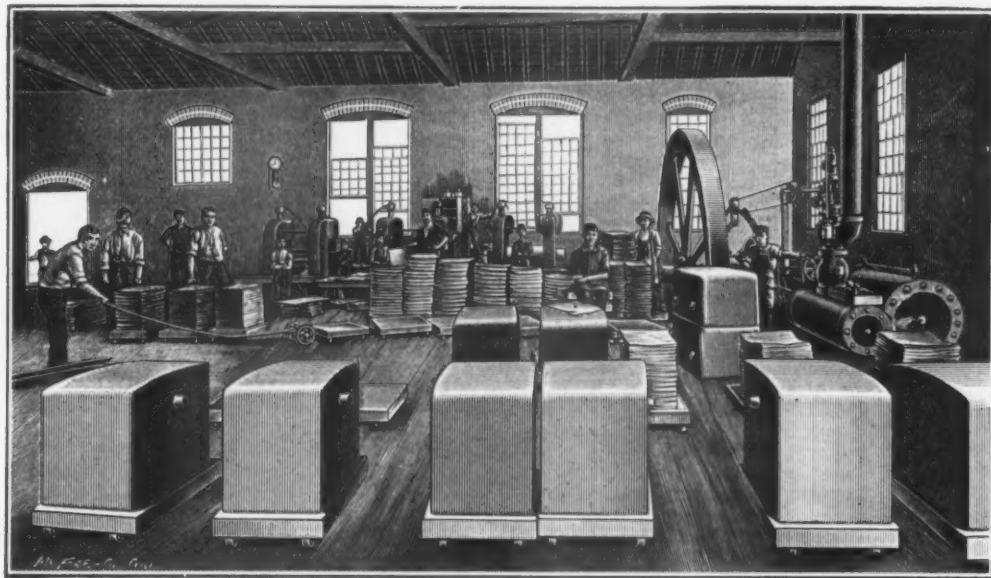


Fig. 3.—Cold Rolls and Annealing Boxes.



Fig. 4.—View of Annealing Furnaces.

WORKS OF THE AMERICAN TIN PLATE COMPANY.

"The manner of coating plates with tin is begun by submerging them in a bath of palm oil until all water disappears, the oil forming a flux for the tin, the first coat of which is received in the tin pot. The plates are next dipped in the wash pot, and when taken out oil is spread over the surface with a brush by hand. The final act in the tin-coating process is in passing the plates through rolls running in palm oil, which evenly distributes the tin, and a smooth surface is obtained. This completes the tinning process. The polish is obtained by rapidly passing the plates through bran and rubbing briskly with

president; W. B. Leeds, treasurer; John F. Hazen, vice-president, and C. S. Tarlton, secretary.

The Frank-Kneeland Machine Company.

The Frank-Kneeland Machine Company have purchased a site of land containing 6½ acres, located on the line of the Allegheny Valley Railroad between Fifty-fourth and Fifty-fifth streets, in Pittsburgh, on which their plant will be located. Two main buildings

modern machinery, tools and roll turning lathes. The other building will be of the same size as the machine shop, and the foundry will be equipped with all necessary furnaces, cupolas, ovens, &c. The electric plant will be driven with automatic engines. The new concern will manufacture a complete line of rolling-mill machinery, chilled, sand and steel rolls, and expect to have their plant in operation not later than February 1, 1893. I. W. Frank, for some years secretary of the Lewis Foundry and Machine Company, Limited, of Pittsburgh is president and general manager, and Edward Kne-

land, formerly treasurer of the same concern, will be secretary and treasurer. Others interested in the new concern are Wm. Metcalf of the Crescent Steel Company, Pittsburgh; Jas. J. Donnell of N. Holmes & Sons, bankers, of that city, and J. H. Purdy, superintendent of the American Water Works and Guarantee Company. The temporary office of the new firm is located in the Shannon Building, Fourth avenue, Pittsburgh, Pa.

■ J. L. Heald of Heald Agricultural Works, Contra Costa County, Cal., 15 years ago

overhaul old engines or those that had been in use, and it was the exception to find snap rings that were loose in the piston heads, but it was not unusual to find cylinders cut out by rings fitted tight, and thrust out by the pressure beneath them so as to score the cylinders.

Jones & Laughlins, Limited, of Pittsburgh and Chicago, have had remarkable success in the general recognition of their new Larimer column by the architectural iron trade. Their facilities for the manufacture of the column have been tested to

METAL-CUTTING TOOLS.—VI.

The Machine Reamer.

As the standard reamer should never, under any circumstances, be used otherwise than by hand, it is necessary to provide a tool for use in lathe and drilling machine; and, for this purpose, we have the chuck, or, more properly, the machine reamer. The proper function of this tool is what might be termed preparatory—that is, it should be used after the drill, or drills, to bring the holes to an approxi-

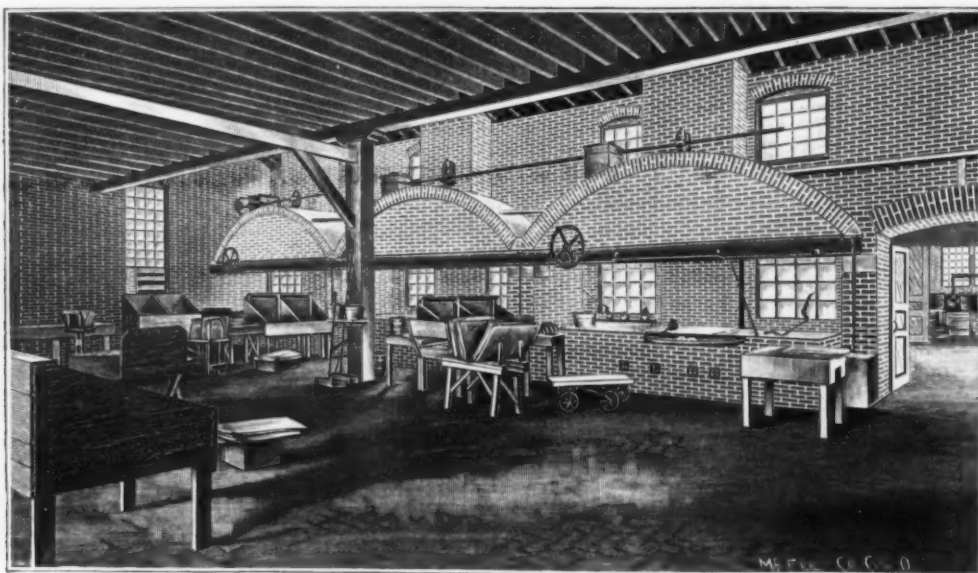


Fig. 5.—Charcoal and Coke Plate Tinning Stacks.



Fig. 6.—Terne Plate Tinning Stack.

WORKS OF THE AMERICAN TIN PLATE COMPANY.

commenced to fit snap rings in the pistons of his engines, with a play of $\frac{1}{8}$ inch side-wise. *Industry* reports that his proposition was that a snap ring, unless loose, was a poor packing, or no packing, and that the oil gum on four surfaces would make up the play, and if it did not, the movement of so light a piece so short a distance would do no harm. This is an important matter in practice, because out of hundreds of engines for hard duty, fitted in this manner, not a single cylinder has failed to wear smooth and keep tight. In Mr. Heald's business there was frequent occasion to

the utmost, and it has been found necessary to provide more machinery specially adapted to bending the beams used in its construction.

The State of New York, for the first time in over half a century, is practically free from debt. The only obligations of the State outstanding can be canceled at any time. The cash balance to the credit of the general fund at the close of the fiscal year ending September 30 was \$1,903,312.11.

mately uniform size, and to take out any inequalities left by the drill. For accurate work it should leave the hole enough smaller than the finished size to allow for a proper cut with the standard hand reamer. As the machine reamer will almost invariably cut larger than itself, and also make the hole slightly taper, this fact must be provided for in the original size to which it is ground. It will also cut different sizes on different materials, and whether used with or without oil. Furthermore, as the amount of stock necessarily left for its cut is comparatively

large, it becomes dulled and the size correspondingly decreased much more rapidly than the hand reamer. For these reasons it is obviously unsafe to depend on this tool for finishing, except for rough work, where duplication is unnecessary. While in a general way it is similar to the hand reamer, it differs as to size and the amount of edge clearance allowable. Being firmly held to the work, and the motion of reamer or work, as the case may be, being perfectly steady and the feed perfectly under control, the clearance may be much greater without causing any tendency to chatter. It may, therefore, be ground with a fine wheel by placing on the index centers of grinding-machine. If done by a wheel whose axis of revolution is parallel with that of the reamer, the former should be of as large diameter as possible, as otherwise the clearance would be hollow ground, which would greatly increase the angle at the expense of durability and efficiency of the tool. Much the best method of clearance grinding is that in which the wheel is set with its plane of rotation parallel with that of the reamer. This will obviate the curvature of the other method and enable the operator to know exactly the angle and amount of clearance he is giving the tool. The amount of taper at the point should be considerably greater than that of the hand reamer to enable it to enter the hole without difficulty, even if the amount of stock to be removed is comparatively large.

In both of these tools—in fact, any straight-fluted reamer—the size is necessarily decreased continually by use by reason of the wear of the cutting edges. It therefore becomes necessary, after the reduction reaches an objectionable amount, to restore them to their original size. This may be done repeatedly if the quality of steel be such as not to suffer deterioration by the continual hardening and annealing required each time the tool is dressed. The operation, of course, is simply setting out the teeth; and a method, probably as good as any, is, after carefully annealing, to place the reamer on the lathe centers, and, after screwing up tightly, wedge the carrier in the face-plate slot and lock the back gears. This will hold the work firmly in position, and it can be indexed around by the gears as required to bring the teeth successively in the most convenient position for the operation. The tool used should be a narrow set, having the end carefully finished, perfectly smooth and true, and the lower corner slightly rounded off. The thickness of edge should be a little greater than the depth of grooves in reamer, so as to cover the entire edge. Guiding the set by resting the hand along the body of the reamer, it should be tapped with a light, quick blow, moving it about $\frac{1}{4}$ inch each time the entire length of groove. After going over the tooth in this way once it is best to proceed with the next, and so on until all have been subjected to the same treatment, after which the size may be calipered, and if the size is found to be insufficient to allow of ample stock to insure its finishing up properly, it will be necessary to go over it again in the same manner. This will generally suffice, unless the reamer has been reduced more than is allowable. The operation of setting is very simple, but requires careful work to accomplish it properly. The subsequent operations of hardening, tempering and grinding are, of course, the same as for a new tool.

The Shell Reamer.

The shell reamer is simply a hollow cylindrical form, made to use on a mandrel or bar. It is generally used for sizes which would be inconveniently heavy and unwieldy if made in the form of the ordinary solid reamer, which would also be unnecessarily expensive. They are used

for both standard and machine use, and are precisely the same as to construction and use as the respective solid patterns.

Other forms of straight reamer are the adjustable and the expanding types. The former are very similar in appearance to the solid reamer, but they are made with detachable and adjustable teeth set in the permanent stock or body. There are several forms of this tool, having different methods of adjustment, but the one most commonly used is made with seats for the teeth planed with the body set taper from neck to point. The teeth, of course, have a corresponding taper, and by driving up from the point, the size may be increased, or *vice versa*. In some shops, where this form of reamer is preferred, the stocks are very carefully made and the grooves finished after the body has been hardened and tempered. This gives them increased durability and should render them good for wearing out many sets of teeth. The size of such reamer should never be permitted to be altered outside of the tool-room, as an irresponsible and incompetent workman might cause the spoiling of not only his own work, but also that of others who might afterward use the tool before the error of adjustment was discovered. The original and only legitimate object of the device was to provide a more simple and inexpensive method of keeping the size than is possible where the solid tool is used. If used in this way and for this purpose only, the adjustable reamer is a good tool, otherwise it is a very dangerous one. For standard, at least, it should never be used after setting out until it has been reground and cleared; for machine use, on rough work, the risk is not so great, but still it is a bad plan to take any unnecessary chances.

The Expansion Reamer.

The expansion reamer, like the expansion center bit, is a sort of *multum in parvo*, and is intended to use for any desired size between its maximum and minimum limits. Of course, for straight work, the expansion must be perfectly parallel, and the tool very accurately and carefully made, or it will be worse than useless. The teeth are made taper on their inner edge, and are carried in a hollow body or shell, where they bear against a tapered mandrel or core, which is adjusted longitudinally by means of a screw motion. For many purposes the tool is a very useful one, and, in job shops, where there is a large variety of miscellaneous work, they will always "pay for their keep." They are also made for taper work, where a greater range of size is desired than can be had with the ordinary solid form. The latter and all special shapes of fluted reamer should be made similar to the straight with reference to construction of the teeth, but, as they are required to remove considerable stock in giving form to the roughly drilled hole, more edge clearance is required to enable them to work rapidly. Care must be taken, however, not to exaggerate this feature, or they will give continual trouble from catching, and cause risk of breaking themselves or the work, whichever be the weaker. Slow feed, careful feeding, and frequent withdrawals to clean out the chips, are necessary to the successful use of these tools, no matter how correctly they are made. Flat, half-round and square, taper and shape reamers are also used—the first two are very good for some classes of work; the latter is an abomination, as violating all correct principles of metal cutting, and should never be used, except as a makeshift, when nothing else is available.

Boring Tools.

Boring tools, while of almost endless variety, may be considered as merely modifications of a few general types, embracing

the functions of the several kinds of lathe tools previously described. There are three distinct methods of using them, each of which has its modifications, and may be used indiscriminately in lathe, drill press or horizontal or vertical boring machine. The overhung bar is used for comparatively short work only, and is attached to the driving spindle either by bolting to the face plate or by having a taper shank fitted to the socket of the spindle. For heavy work on large lathes they are usually made of cast iron, and provided with a good-sized flange, by which they are bolted to the face plate. In this case the bar revolves, and the work, bolted to carriage, is fed by the regular lathe feeding device.

There are several methods of holding the cutters, which are usually placed at, or near, the end of bar. For work of large diameter, such as engine cylinders, &c., a very convenient device is to have a flange or disk on the outer end of the casting, in which is fitted a transverse slide furnished with a feed screw, and means of clamping in position after adjustment, the slide, of course, being provided with some convenient method of holding the cutter or tool. The latter, for this style of rig, may be regular lathe tools, such as are used for inside turning. All varieties of work necessary for almost any conceivable purpose may be done by the device, such as finishing the bore, squaring off and facing flanges of cylinders, recessing, internal thread cutting, &c., and even outside turning, where the character of the work requires the several operations to be completed at the one setting. As before stated, the tools used partake more of the character of turning than of boring tools.

While strictly speaking the operation of boring is specifically inside turning with a rotating tool, this distinction does not hold good exclusively, for the reason that some of the largest work is done by the use of a stationary bar in the vertical boring mill, upon which the work revolves. Whether the work or the tool revolves, however, is immaterial so far as the form and operation of cutting of the latter is concerned. A modification of the cast-iron boring arm is used for diameters too small to admit of the use of the latter. It consists of a bar of wrought iron or steel, having usually a cross foot forged on the end in the place of the flange, by which it is bolted to the face plate. The cutter is generally held in a rectangular slot cut through the bar a short distance from the end, and is secured by means of a taper key, or a set screw tapped into the end of the bar and extending through to the slot. The adjustment is made by tapping out the cutter until the proper size of hole or depth of cut is obtained, and then setting up firmly on the key or set screw.

Where the bore does not extend entirely through so as to open at front end, it is sometimes necessary that it be bottomed—that is, the closed end must be squared up. This requires the use of an offset tool or a bar having a dovetailed slot in the end, so that the cutter may project beyond the bar and be capable of working on both the periphery and the end of the bore. An instance of this class of work is the hydrostatic cylinder in a wheel press, which from its shape (being usually cast in one piece with the housing) cannot conveniently be bored in any machine on which the work is required to revolve.

For work of still smaller size, the bar used may be provided with taper shank to fit the socket of spindle. The method of holding cutters is the same as for the bar last described. Where the depth of work will admit of its being done it is well to support the outer end of this bar by means of the dead center, which will be very effective in preventing any springing of the bar and consequent chattering

of the cutter—the result of which is apt to be a hole neither straight nor round. Also much heavier cuts and stronger feed may be used where the outer end of the bar is rigidly supported.

The next form of bar to consider is that which passes entirely through the work, and is carried by the centers in the lathe or by the spindle socket and a tail bearing or center in the horizontal boring machine. As it is generally used for long work of small relative diameter, or for a number of bores on the same axis which require to be finished at the one setting, the bar is provided with a number of through slots for carrying the cutters in any portion of the length of bar required to suit the work. For use in the lathe this bar requires the work to be clamped to the carriage and fed in the usual way.

In the horizontal the spindle feed is used, and the bar must therefore pass through the tail bearing as it is fed to the work. This bearing is a very important feature in the use of the bar, as unless the alignment with the axis of the spindle be exact a taper hole will be the unavoidable outcome. Therefore ample means of accurate adjustment as to position become absolutely indispensable, and also a provision for taking up any lost motion between the bar and its bearing, the effect of which would be a hole both taper and out of round. This form of bar is sometimes used (though of much shorter length) in the vertical boring mill. In this case, however, the bar is usually stationary, while the tail bearing, being in the table of the machine, necessarily revolves with it and cannot therefore be out of line with the bar if the machine be in good order, and, of course, requires no adjustment.

On both horizontal and vertical machines the tail bearing is provided with a set of hardened bushings for the different sizes of bars used. For the former machine they are made adjustable as to internal diameter, to enable them to fit the bar accurately. About as simple and effective a method as any, for this purpose, is to turn the bushing taper on the outside (the bearing by which it is carried being tapered to correspond) and cut through the entire length on one side. By means of a bolted flange, or other similar device, the bushing may be forced into its bearing until it closes sufficiently to properly fit the bar, after which the accurate line adjustment may be made.

The Roughing Cutter.

The cutters for all bars in which they are carried by the transverse slot are of four kinds for general use, and others as required for special work. The first, or roughing cutter, having the function of the diamond-point lathe tool, may, of course, be of the general characteristics of the latter—that is, as to angle of cutting edge, clearance, &c. It is made of flat bar steel, and need not be forged, as its shape may readily be made by filing. It should be of a thickness to fit snugly in the slot, and the width enough less than the length of slot to allow room for a square taper key by which it is held in the bar. By some the corresponding taper is made in the end of the slot, and the cutter may then be parallel. It is much better, however, to make the slot parallel at the ends for the reason that it is necessary to be able to put the cutter in to face either way, and the tapered ends interfere with doing so. The back edge of the cutter can as readily be made to suit the key, which prevents any such difficulty, though, of course, it can be used but the one way, and another must be provided when the setting needs to be reversed.

In setting for the cut the key should be driven firmly enough to hold the cutter against any danger of slipping, and the adjustment made by tapping the latter

in or out, as required, and trying the resultant cut with the caliper; after which the key should be firmly driven home. Of course, for the following cuts, if they be necessary, the cutter must be set out still further, or if it be too short to reach for the required diameter it must be replaced with a longer one. As it is always desirable to use as large a bar as will go into the existing hole at starting, to gain as much stiffness as possible, the first cutter cannot be of a length much greater than the diameter of bar, and consequently it is apt to fall short if the size of hole is to be greatly increased.

Illinois Coal Statistics.

The report of the State Inspector of Mines to the Bureau of Labor Statistics regarding the condition of the coal miners of Illinois has just been published. In brief it is as follows:

| | |
|---|--------------|
| Number tons coal mined in 1888..... | 14,328,181 |
| Number men employed..... | 29,410 |
| Aggregate value of product..... | \$16,084,806 |
| Aggregate amount paid miners..... | \$10,274,739 |
| Number tons coal mined in 1890..... | 15,274,727 |
| Number men employed..... | 28,574 |
| Aggregate value of product..... | \$15,571,051 |
| Aggregate amount paid miners..... | \$10,925,454 |
| Number tons coal mined in 1892..... | 17,944,989 |
| Number men employed..... | 33,675 |
| Aggregate value of product..... | \$19,688,593 |
| Aggregate amount paid miners..... | \$12,835,512 |
| Increase of tonnage of 1892 over 1888..... | 3,616,808 |
| Increase in men employed..... | 4,215 |
| Increase in aggregate amount paid for wages..... | \$2,560,773 |
| Increase in aggregate value of total product..... | \$3,603,777 |
| Increase of tonnage of 1892 over 1890..... | 2,670,262 |
| Increase in number of men..... | 1,051 |
| Increase in aggregate amount paid for wages..... | \$1,909,958 |
| Increase in aggregate value of total product..... | \$4,117,536 |

The percentage of increase of 1892 over 1888 in the total product in tons is 25 per cent.; of men employed, 14 per cent.; of amount paid for wages, 24 per cent.; of the aggregate value of the total product, 22.4 per cent.

The percentage of increase of 1892 over 1890 in the number of tons produced is 17.5 per cent.; of men employed, 17.7 per cent.; of wages paid, 18 per cent.; of aggregate value of total product, 26.4 per cent.

The value of the coal is based on the product at the mine. It is found that the average daily wages paid to miners in 1891 was \$1.66 per day. The average paid in 1892 was \$1.92, an increase of 15.6 per cent.

Strike and Lockout Losses.—The annual report of the Bureau of Industrial Statistics of Pennsylvania has just been issued from the Department of Internal Affairs. The loss by strikes at various places are given as follows: Braddock wire mill \$40,000; employers \$30,000; Jefferson township coal miners \$143,000; employers \$34,000; Hildale coal miners \$56,250; employers \$1725; Monongahela City coal miners \$1,000,000; employers \$1,000,000; Pittsburgh stone masons \$201,600; employers \$102,000; plumbers \$82,500; employers \$60,000; tanners, \$44,375; employers \$33,000; stone cutters, \$142,560; employers \$72,000; plasterers \$78,700; employers \$45,000; house painters \$153,000; employers \$68,250; hod carriers \$150,000; employers \$60,000; carpenters \$702,250; employers \$538,000; Sharpsburg rolling mill \$60,000; employers \$50,000; Scott Haven coal miners \$40,000; employers \$4000; Allegheny County coal miners \$90,000; employers \$15,000. The river coal miners' strike and one in eastern Pennsylvania for wages due were the only ones that succeeded out of a total of 60.

The Shenango Valley Bessemer Plant.

(With Supplement.)

The Shenango Valley Steel Company at New Castle, Pa., closed a contract with the Pittsburgh Iron & Steel Engineering Company on November 6, 1891, for the construction of a new steel plant. The work has been entirely completed, including foundations, tested, and is ready to go into actual operation at an early date. The works are intended to supply billets and slabs, a large proportion of which are consumed by parties interested in the steel company. The output of the works is intended to be from 500 to 800 tons, of which the local demand exceeds some 400 tons.

The plant consists of two 8 ton vessels, practically a duplicate in capacity of those at the mill of Jones & Laughlins, Limited, at Pittsburgh. These vessels are supplemented by three 10-foot cupolas, arranged with a view of a possibility of using direct metal, which would be obtained from the Crawford Iron & Steel Company and the Raney & Berger Iron Company, both of Newcastle, who are part owners in the steel company. The pit system of casting is adhered to, the ingots being transferred directly from the pit to the soaking pit furnaces, two five hole soaking pit furnaces being located adjacent to the pit.

A 36-inch blooming mill is provided of Mackintosh, Hemphill & Co.'s build, which will permit the edging of 24-inch ingots, and will give a range of sizes from 20 x 3 inch to 4 x 4 inch. A feature in connection with this blooming mill is the introduction of a massive hydraulic shear located midway between the mill and the blooming mill shear proper, thus enabling a billet to be cut in halves and both pieces run at once under the main shear, or one piece transferred to the auxiliary billet mill.

Owing to the peculiar location of the mill with reference to the railroad tracks, the blooming mill was placed at an angle of 45° to the axis of the main works. The double lines of tracks shown on the plate are 16 feet above grade, enabling them to be used as coal tracks for boilers and producers, and as stock tracks for metal.

The blowing engines consist of two vertical engines, 42-inch steam cylinder, 60-inch blowing cylinder, 60 inch stroke. The steam is supplied by 12 multitubular boilers, 6 feet in diameter, 18 feet long, with 55 4-inch flues, same being built by Riter & Conley of Pittsburgh, the regular working pressure being 125 pounds. The hydraulic system consists of three Wilson Snyder's duplex outside packed plunger pumps 7 x 22 x 24. The blast for the cupolas is supplied by two No. 10 Sturtevant fans.

The heating furnaces are fitted with disk reversing valves, doing away with the old type "butterfly" valves, a feature which calls for much more elaboration in the construction of furnaces, but from which the designers anticipate a relief from the annoyances incident to the use of the old "butterfly" valves. The converters are at an elevation of about 14 feet (measured to the center of the trunnion) above the general level, enabling a *débris* car to be run under the nose of the vessel when the same is tipped. The melted metal car running in front of the vessel is dragged by wire rope. The elevation of the soaking pit furnaces above the general level was compulsory, owing to the high water mark in the adjacent Shenango River.

A feature in the cupola house is the fact that the cupolas proper end with the charging floor. What extends above that point can simply be regarded as a hood, leaving a clear opening entirely around the cupola for charging purposes.

The distance from the blooming mill to the main shears is 100 feet, thus enabling

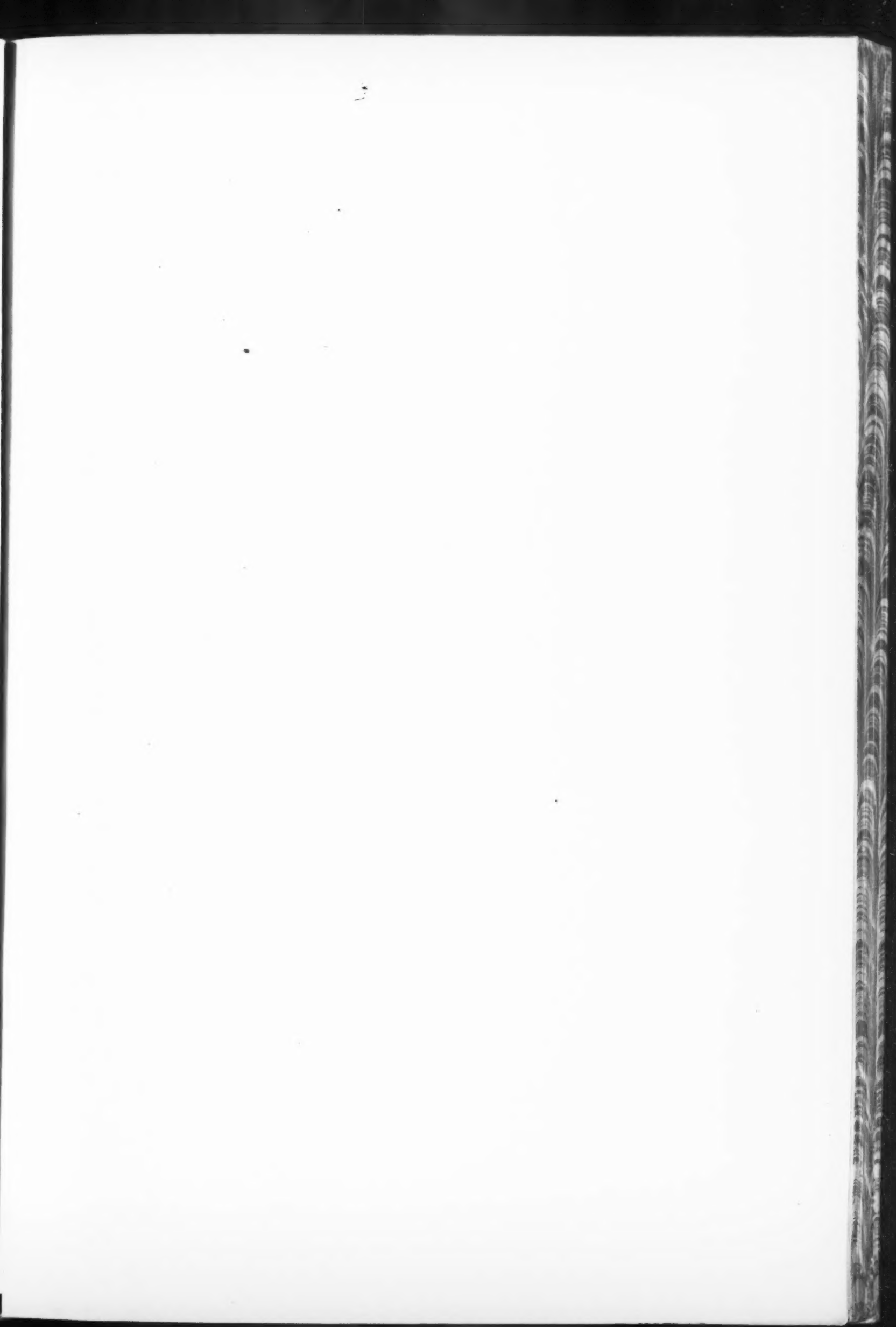
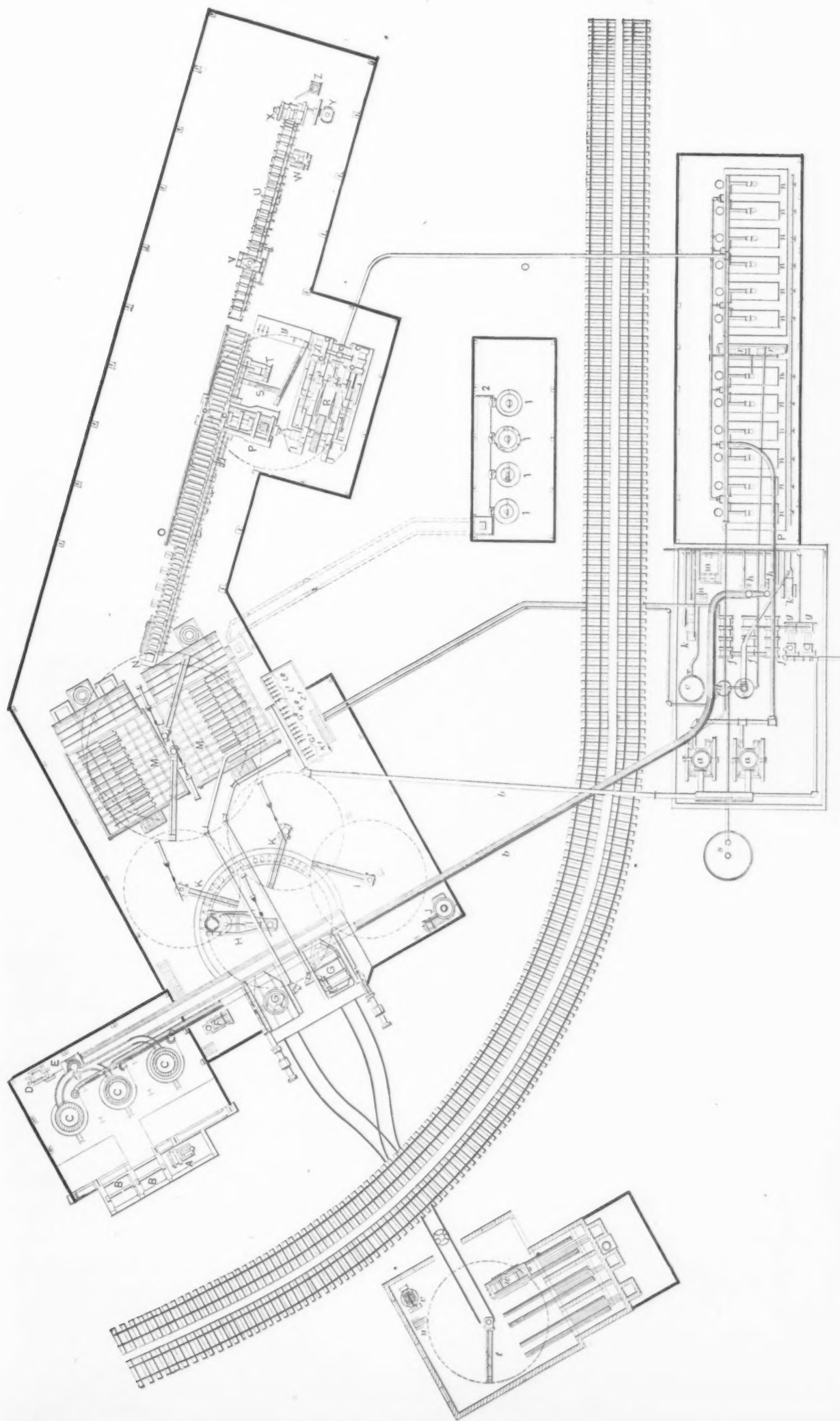


FIG. 3.—ELEVATION OF BESSEMER PLANT.



Engine.
Z 8" Water pump.
Z² Hydraulic valve pulpit.

FIG. 1.—GENERAL PLAN.

THE BESSEMER PLANT OF THE SHENANGO VALLEY STEEL COMPANY, NEW CASTLE, PA.

Built by the Pittsburgh Iron and Steel Engineering Company.

a 2-ton ingot to be rolled down to 4 x 4 inches and sheared without interfering with the rolling of following ingots. The engines driving the blooming mill are 42-inch diameter, 60-inch stroke, geared 5 to 7, and are duplicates (except the gearing) of those driving the blooming mill of the Sparrow's Point Works.

The hydraulic cranes throughout are all rotated by power. The drawing crane deposits the heated ingot in what may be termed a hydraulic cradle, N, Fig. 1, which holds the same until ready to allow

Bessemer plants built within the last year or so this concern has, we believe, built all but one. Among the contracts they now have on hand is one for the erection of the new Bessemer plant to be built by the National Tube Works Company at McKeesport, Pa., mention of which has already been made in these columns. The officers of the Shenango Valley Steel Company are: Wm. E. Reis, president; Jas. Crawford, vice president; Geo. B. Berger, secretary and treasurer, and Jno. Stevenson, Jr., superintendent.

A New Gib Lathe.

By referring to the engraving it will be noticed that the power gearing of this lathe, which is made by Finney & Rhodes of Hartford, Conn., is brought to the front of the head block instead of the rear, as usually. By doing so the power is applied to the spindle downward and against the lifting tendency of the tool in the tool post, thereby reducing the inclination to chatter to a great extent. Contrary to the impression that a lathe geared in this manner would interfere and be in the way of the operator, an inspection will prove that it is not, and being amply protected by a shield over the gearing at the face end of the spindle it makes a clean lathe to work with, as no oil or dirt can fly from the gearing or rub off on the clothes of the worker.

entirely covered and protected, passing through the center of the lathe carriage in a direct line to the center of the taper attachment, to which it is connected by a sleeve. At the back of the lathe bed is cast, solid with the same, a shelf nearly the full length of the bed, on which is swiveled the taper bar, the slide of which is fastened to the sleeve of the cross-feed screw in such a manner that the pull and resistance are all in a straight line; so that when the taper bar is set at its greatest range, which is about 2 inches to the foot, in moving the lathe carriage by hand the resistance is barely felt by the operator.

A shaper attachment (shown in the small view) designed for this lathe is quite a novelty in this line and is made to fasten to the same table on which is the taper bar. It receives its motion from a special face plate. It has a stroke of 8 inches or less as wanted, thereby increasing the utility of the lathe, especially in small shops or experimental rooms, combining a lathe and shaper in one tool.

THE WEEK.

Commodore Farquhar has authorized the use of the old steam engineering building at the League Island Navy Yard for the reception of the new tools purchased. The scheme that has been on foot for several years, of transforming this yard into an immense marine engine and shipbuilding establishment, will thus be given a new impetus.

The Brazil line steamer "Allisna" on her initial trip to the River Plate took out 1000 tons of agricultural machinery, 150 tons of telegraph wire, binding twine, shucks, &c.

James Hughes, Master Workman of the National Garment Workers' Assembly, was sentenced to one year's imprisonment in the Monroe County penitentiary by Judge Davy in the Supreme Court on the 3d inst. In 1891 Hughes was convicted of extorting \$1000 from the clothing firm of L. Adler Bros. & Co., in Rochester, whose employees were on strike. He was then sentenced to a year in the penitentiary, but appealed to the General Term, which recently affirmed the conviction.

An immense crowd assembled in Ayr, Scotland, October 5, to witness the ceremony of laying the corner stone of the Memorial Library presented to the town by Andrew Carnegie, and he was the recipient of an appropriate gift.

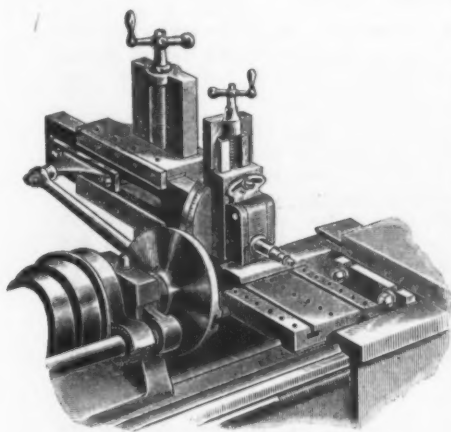
The twin-screw boat "Richard Peck," in a race with the "Puritan," October 5, gained a full mile in a run of ten miles, and was declared the victor.

The syndicate who proposed to introduce the trolley system of car propulsion in this city have resolved to use the cable by including the Ninth and Lexington avenues in the Broadway system and employing horse power in the smaller connections.

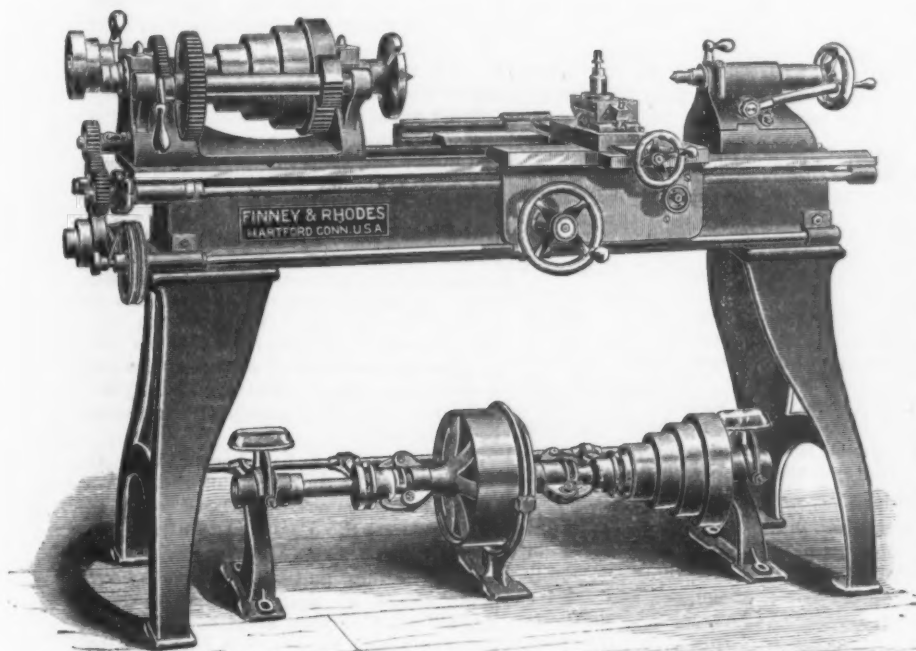
Smoke stacks 100 feet high will be placed on the armored cruiser No. 3. Though unsightly, appearance, in this particular, is sacrificed to utility. The increase in height will give additional draft and do away with the necessity of forced draft in ordinary steaming. It will also carry the smoke and gas from the furnaces above the military masts of the ship, and give the men in the tops a chance to fight without being smoked out.

The exports of manufactured cotton from this country to China are greatly diminished by the low price of silver.

Plowing in the winter wheat belt is unusually forward, much more so than last year at this time. West of the Missis-



Taper Attachment for 14-Inch Gib Lathe.



NEW 14-INCH GIB LATHE.

it to pass to the mill, at which time the cradle rotates until the ingot drops into the feed rollers.

The works taken all in all represent the most advanced ideas on the subject of Bessemer construction, no expense having been spared to embrace in them all features that would lead to additional economies.

In connection with the description of this plant we deem it but proper to call attention to the rapid time in which it was erected. As stated before, the contract was let on November 6 of last year, and in 11 months' time the entire plant, including everything, has been erected and put in complete working order. Of course the credit for this is due to the Pittsburgh Iron & Steel Engineering Company of Pittsburgh. Of the three or four

The feed mechanism is conveyed by small cone pulleys of three steps connecting with groove pulleys carrying straight and cross belts to the feed rod, and is entirely independent of the screw and rocker gears, which are only used for screw cutting. This feature will commend itself, as it is known that the constant use of the rocker gearing for turning soon wears it so that it is unfit for good screw cutting. The worm of the feed rod runs in a reservoir of oil especially provided, so that it is in no danger of cutting and running dry. The tool holder has the range and action of a weighted lathe carriage, and by the turn of a screw is clamped as though it were one solid piece and no pressure or vibration can loosen or disturb it when either at its highest or lowest adjustment.

The cross feed screw in the carriage is

issippi River the largest proportion of the crop is to-day in the ground. Not so much has been done, however, in the eastern portion of the winter wheat belt, but fairly good progress has been made.

The contractor for the construction of the Canadian Soo Canal agrees with the Dominion Government to have the canal completed by the opening of navigation in 1894, two years ahead of contract time.

The American Architectural League in this city opened its fine new structure in Fifty-seventh street with a banquet, President Russell Sturgis in the chair.

South Dakota has had a nine days' Corn Belt Exposition in the city of Mitchell. Some of its features were reminders of the "Corn Palace" of Iowa.

Disquieting reports continue to come from Great Britain concerning the labor outlook, particularly in shipbuilding and manufacturing centers.

The great steel passenger whaleback building by the American Steel Barge Company for the World's Fair traffic will be launched, if possible, before the water freezes. She will measure 362 feet over all, carrying a cabin nearly her whole length. This cabin will be set on turrets, like those on the present whalebacks, and when completed she will be one of the finest and most costly vessels on the Great Lakes.

The new ore dock at Superior is 2400 feet long, with pockets and 1500 feet approach. There are 400 pockets, 200 each side, each having a capacity of 180 tons. Thirty pockets are now ready.

The deposits of the savings banks of Cleveland, Ohio, have increased more than \$4,000,000 in the last 12 months. The rate of gain is about 10 per cent.

A London cable says that 14 British manufacturing firms, mostly in textiles, but one in machinery, have lately moved to the United States.

The East River Bridge Company have applied to the Board of Aldermen for permission to break ground and build approaches to the two new bridges to be constructed, which are to connect the cities of Brooklyn and New York.

A contract has been taken by parties in New York to dredge a ship channel 30 feet deep in the Gulf of Mexico at Corpus Christi, and to provide four miles of dockage for grain vessels, the design being to provide an outlet for the Northwest. The contract is for \$2,000,000.

The assessed valuation of Montreal increased from \$128,413,000 in 1891 to \$136,765,000 in 1892, or by almost \$8,500,000.

Twenty millions of acres of land in the State of Washington are covered with a growth of wood which will cut an average of 25,000 feet of mercantile lumber per acre. Much of it in the vicinity of Port Crescent will cut an average of 100,000 feet and more to the acre, while single trees are common that will cut 3000 feet.

The Commissioner of Navigation at Washington will recommend in his annual report the establishment of two nautical schools, one on the Lakes and one on the Atlantic seaboard, for the better scientific education of seamen for the merchant marine.

With manual labor in India at 4 cents a day, there is little encouragement for the introduction of agricultural machinery. They still plow with two sharpened sticks.

The City of Oaxaca, in Mexico, the center of the richest agricultural region, now for the first time is in direct com-

munication with the United States. Several American firms already have agencies there.

The State of Iowa, greatly favored by nature, is waking up to her opportunities. The great bituminous coal fields of the Des Moines River valley begin and extend for miles along the river bank, the mining being done from the bank without the necessity of shafting. Coal sells for prices ranging from \$2.50 to \$4 per ton, delivered. Almost underlying the city are the great gypsum beds and three mills are now being operated, furnishing the best gypsum known to commerce. The population of Fort Dodge is now a little over 7000 people, showing an increase of about 2000 in the last two years.

Now that the wild rush to Oklahoma has subsided, one of the staid settlers gives a little information respecting that alleged wonderful country. The writer says: "The facts are, Oklahoma is not a paradise, neither is it the other place. It is simply a Territory in almost the center of the United States, which comprises as great, if not a greater, per cent. of strictly first-class agricultural lands as any State or Territory in the Union, and it is crossed by two lines of railroad nearly in the center; another touches the western border, while another is being built from east to west, crossing all lines, so that the hardships of a distant market are avoided."

The yield of the Russian customs in 1891 was about £15,784,000, which showed a decrease of £273,500 compared with the preceding year. Up to that year there had recently been a gradual development of the customs revenue, and the sudden check is attributed partly to the operation of the new tariff which came into force in the middle of last year.

Business prospects in Germany, according to a Berlin letter of the 20th ult., give little promise of an early recovery. Investors and others distrust the present calm.

State Engineer Schenck of New York says the day of small canals has passed, and it is the duty of the State to enlarge the Erie so that boats 260 feet long, 25 feet beam and drawing 8 feet of water can be run through. "The plan," Mr. Schenck said, "is entirely practicable. There is also no question about the water supply. Of the available water shed along the route of the Erie Canal we are to-day utilizing less than one-third."

Speaking of the fire arms made in this country, careful estimates place the number of pistols at 750,000; shotguns, double and single barrel, at 400,000, and rifles of all grades at 500,000. Most of these fire-arms are made in Connecticut, Massachusetts and New York. Meriden, New Haven, Hartford, Bridgeport and Norwich all have large establishments turning out about one-third of the entire home product.

The ceremonies attending the formal opening of the railroad between Jerusalem and Jaffa, on October 20, will be attended by the great officers of state who represent the Sultan, but fear of the cholera will keep away many Europeans.

A large force of workmen are employed in completing a tunnel through the rocks at Weehawken for the Susquehanna Railroad.

The Lake Carriers' Association have raised the wages of ordinary seamen about 50 cents a day and other classes of men in proportion.

The overflow of the Colorado River last spring has converted a vast region, formerly a desert, into a fertile tract where thousands of cattle are already feeding, and it is computed that 6,000,000 acres

will be redeemed within a few years. The so called Sallón Sea is now one of the most fertile valleys in the West.

Steam fitters in Philadelphia are working under police protection, as a result of labor troubles.

The reported reciprocity arrangement with Colombia fell through because Colombia would not grant satisfactory concessions.

The sum of \$50,000 from an unknown source has been granted in aid of a manual school in course of erection at Mount Airy, Germantown, Pa.

The Michigan Central intend to erect an elevator and docks at South Haven, Mich., from whence they will run a line of iron steamers to Milwaukee.

Trade with San Domingo, respecting which various reports are in circulation, is unimportant. Our total imports from San Domingo for the year ending June 30, 1891, were valued at \$1,610,360 and our exports at \$986,826. The figures for ten months ending June 30 last, which are given more in detail, show our exports to have been \$865,461, an increase of \$24,510 over the ten months ending June 30, 1891. The largest single item of export in the Treasury figures is "machinery not elsewhere specified, \$200,996."

James Gillies has received the contract for the timber dry dock at Brooklyn, N. Y. He was the lowest bidder.

The ravages of yellow fever at Santos, in Brazil, are appalling. One account says the victims outnumber all who have been swept away by cholera in Central Europe, and that 347 vessels in port waiting to discharge are likely to be detained another year.

Four million candle power on the Statue of Liberty will assist mariners in navigating New York Bay.

A medical expert recognized as authority writes to London papers that the recent outbreak of cholera at various points widely separated is evidence that "seed is being sown over a wide area in Central Europe ready for the death harvest in 1893." American physicians emphasize the necessity of providing against a visitation from the destroyer next year, and advise that no precautionary measures be neglected.

Great discontent has been caused in New Zealand by the refusal of the British Government to share the cost of mail service across the Pacific Ocean from San Francisco.

The grinding, polishing, tempering and paint shops of the American Axe & Edge Tool Company, at Ballston, N. Y., formerly Isaiah Blood's, was destroyed by fire last Friday. The fire caught in the tempering shop, and an excited employee threw what he supposed was a pail of water on the flames. The pail, however, contained oil, and the flames sprang up so vigorously that soon the whole building was on fire, and was destroyed before apparatus could be got in readiness to throw streams of water from a force pump. The loss will probably amount to \$50,000. The insurance is unknown.

It is reported on good authority that Wm. Weihe, for about ten years president of the Amalgamated Association of Iron and Steel Workers of Pittsburgh, but who will sever his connection with that organization on November 1, has decided to connect himself with the Oliver Iron & Steel Company of Pittsburgh.

We understand that the Bethlehem Iron Company, at South Bethlehem, Pa., are making preparations for the building of a new large blast furnace.

The Iron Age

New York, Thursday, October 13, 1892.

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Our Plate Mills.

One of the most striking features of the iron and steel manufacture during the past decade has been the rapid annihilation of capital through improvements in plant, coupled with a tremendous increase in producing capacity. Old established concerns have been forced to practically rebuild, with the alternative of going out of the business entirely. The first branch in which this movement was so conspicuous was the steel rail manufacture. One great concern has to-day what was once a great mill standing idle alongside of its younger successor. Another tore out every piece of machinery, capable of splendid work, to put in the plant representing the latest achievements. A third built an entirely new works, and others were forced to purchase more modern concerns established in their vicinity. Those who would not or could not keep up with the times withdrew from the business, and yet, in spite of the reduced number of makers, the capacity for production has greatly increased.

During the past two or three years a similar revolution has been in progress among the makers of steel plates. It is not many years since when the makers capable of producing a heavy tonnage of large steel plates in modern mills could be counted on the fingers of one hand. Their business was known to be very remunerative, and as their operations extended with the growing use and greater cheapness of steel, they cut heavily into the business of the old established iron-plate mills. The latter, to meet the demand for larger sizes and weights and to increase their tonnage, put up greater mills, until we possess to-day a series of works East and West whose hungry maws it seems difficult to fill with work. The Eastern concerns have for quite a long time been very lively competitors in Western markets, while only three Pittsburgh works make active efforts to capture Eastern business.

The transformation of old plants into establishments equipped with the latest modern machinery has been the most striking fact in the plate trade. It has been coupled with a marked increase in the capacity, since the effort of each manufacturer has been to reduce cost by distributing general expenses over a larger tonnage and by the introduction of labor-saving devices. It may be doubted whether the demand in the next years will be large enough to give all the modern mills full employment. It looks now as though it may take some time before the country grows up to the existing facilities.

Tin-Plate Prospects in Indiana.

From present appearances, Indiana seems destined to become an important tin-plate manufacturing State in the near future. The American Tin Plate Company, at Elwood, are well known to the entire country by this time, having been very thoroughly advertised. The plant of this company is one of the finest ever built for the purpose, and it is now in active operation, with orders booked ahead for its entire output for two to three months.

The Anderson Tin Plate Works, at Anderson, are small in extent, having but two tinning stacks and no rolling mill, but the ownership has recently changed, prominent Chicago capitalists have become interested and the works may be expected to render a good account of themselves from this time forward. Plans have been prepared for a complete establishment at Atlanta, northwest of Noblesville, embracing rolling mills as well as tinning stacks, and contracts will be let soon for the machinery with the hope of getting it into operation during the winter or early in the spring. The name of this concern will be the Indiana Tin Plate Company, and its capital is fixed at \$250,000, with subscribers at New York, Chicago and Indianapolis. At Gas City, 5 miles east of Marion, Morewood & Co. have made considerable headway in laying the foundations for a plant which they propose to make the largest tin-plate works in the world, covering open-hearth steel furnaces, rolling mills, tinning stacks and a machine shop for the manufacture of tin-plate machinery. Another tin-plate plant has been located at Alexandria, on which the work of erection is to begin at once. Two other schemes of the same character are in contemplation, and the comparative advantages of several localities are being considered by the projectors before definitely concluding arrangements to build. The Corning Steel Company, at Hammond, propose to add the manufacture of tin plates after they get their sheet mills into smooth running order. The Midland Steel Company, at Muncie, whose sheet mills have also just been put in operation, will manufacture tin-plate bars and will also roll a part of their product into sheets for tinning. Of all the works enumerated, the Corning Steel Company's plant is the only one outside of the gas belt.

If all the projects now getting into shape are pushed to completion, it will be seen that Indiana will take a very important position in the American tin-plate trade. Natural gas and geographical location combine to make it a most eligible locality, and the citizens of the various cities and towns in the gas belt are doing all in their power to make these advantages count in influencing prospective tin-plate manufacturers to select locations in that State. The permanence of the gas supply is no longer a matter of conjecture or speculation, but seems to be as well settled as such a question can be. Consumers of natural gas have profited by ex-

perience, and now comprehend the importance of properly conserving the great riches which nature has lavished on this district. Five or six years' experience has done much in this direction. When the pioneer manufacturers of the district are steadily enlarging their facilities and increasing their investments of capital, relying upon the continued possession of a sufficient supply of gas, a degree of confidence is manifested which is very convincing to disinterested observer. The past 12 months have witnessed greater activity than any previous year in the enlargement of old enterprises and the location of new ones in the Indiana gas belt. It is therefore not a matter of surprise that the tin-plate industry should be so well represented in the march of manufactures toward Indiana.

Chief-Justice Paxson's Charge.

There is no uncertain sound in the charge to the Grand Jury delivered by Chief-Justice Paxson of the Pennsylvania Supreme Court, in the cases of the Homestead strikers charged with treason. Thus far only abstracts have reached us, but they indicate pretty clearly that one of the most eminent jurists of the State looks the facts squarely in the face and locates the responsibility where it belongs. There is in his deliverance no trace of the maudlin sentiment which carried away so many good people early in the contest, and which was pandered to with such outrageously open grabbing after popularity and dollars by a few conspicuous newspapers. Justice Paxson said:

We can have some sympathy with a mob driven to desperation by hunger, as in the days of the French Revolution, but we can have none for men receiving exceptionally high wages in resisting the law and resorting to violence and bloodshed in the assertion of imaginary rights, and entailing such a vast expense upon the taxpayers of the commonwealth. It was not a cry for bread to feed their famishing lips, resulting in a sudden outrage, with good provocation; it was a deliberate attempt, by men without authority, to control others in the enjoyment of their rights. The existence of such a state of things in a government of law indicates a weak spot. It is not in the law itself; that is sufficient for the preservation of order; all that is needed is its proper enforcement.

The rights and duties of both employer and employees are clearly defined as follows:

When the company shut down its works and discharged its men it was acting strictly in the lines of the law; it could not compel the men to work, nor could the men compel the company to employ them; no arrangement could be made in such regard except in the nature of a contract agreed upon by the parties. Upon these subjects the rights were mutual. The company had the undoubted right to protect its property; for this purpose it could lawfully employ as many men as it saw proper, and arm them if necessary. Many of our banks and places of business are guarded by armed watchmen. The law did not require it to employ as watchmen the men from whom it anticipated the destruction of its works.

The right of the men was to refuse to work unless their terms were acceded to and persuade others to join them in such refusal, but the law will sustain them no further. The moment they attempt to control the works, and to prevent by violence or threats of violence

other laborers from going to work, then they placed themselves outside the pale of the law. It cannot be tolerated for a moment that one laborer shall say to another laborer: "You shall not work for this man for that wage without my consent," and then enforce such command by brutal violence upon his person.

It will be observed that Justice Paxson ranks among those who acknowledge that the owner of industrial property has as much right to employ watchmen to protect it as the possessor of a bank. It is the expediency of such a step alone which managers of such concerns need discuss. The duty of the State is clearly set forth as follows:

It is the duty of the State to protect every citizen within her borders; in this there is no distinction between the laborer and the capitalist; it protects each with equal impartiality. When the State fails to do this it fails in its duty as sovereign. It should protect with a firm hand the individual laborer from the tyranny and unlawful demands of organized labor. The law should be enforced from the Delaware to the Ohio, so that the humblest laborer can work for whom he pleases and at what wages he sees fit, undeterred by the bludgeon of the rioter or the pistol of the assassin.

In defining treason, the Justice said:

You will also observe that the offense charged is treason against the State, and not against the United States; it is a matter with which the latter has nothing to do, and over which it can have no jurisdiction. A mere mob, collected upon the impulse of the moment, without any definite object beyond the gratification of its sudden passions, does not commit treason, although it destroys property and attacks human life. But when a large number of men arm and organize themselves and engage in a common purpose to defy the law, to resist its officers and deprive their fellow citizens of the rights to which they are entitled under the Constitution and laws, it is a levying of war against the State, and the offense is treason.

Where a body of men have organized for a treasonable purpose, every step which any one of them takes in part execution of their common purpose is an overt act of treason. Every member of such asserted government who has participated in such usurpation has committed treason against the State. It is a maxim of criminal law that a man must be presumed to have intended that which is the natural and probable consequence of his acts. We have reached the point in the history of the State where there are but two roads left us to pursue. The one leads to order and good government; the other leads to anarchy.

Whatever may be the outcome of the proceedings now begun, we welcome the presentation of the case by Chief Justice Paxson as one which brushes away for a long time to come many hazy notions as to the rights and responsibilities of union men. They will perhaps understand and remember for at least a few years that the possession of power must be coupled with the intelligence to wield it in such a manner that it does not trench upon the domain of greater powers.

We believe that a good many foundrymen, and notably those who melt iron for the manufacture of machinery and for light castings, do not sufficiently appreciate the advantages which might accrue to them by using charcoal iron more largely. Charcoal iron has been selling at very low prices for a long time, and in certain sections of the country, notably those cheaply reached by the Michigan product, the cost

over good coke iron is not very great. In a good many cases the slightly higher cost would be more than compensated for by considerably increased strength, and it might be possible to cheapen the mixture without much sacrifice of that advantage by using lower grades of coke irons. The difference between charcoal irons and good coke pig is only about \$1.50 to \$2 in the leading markets on the Lakes—an amount which does not cut much of a figure in the cost of many kinds of castings when greater strength is considered. Sellers of charcoal pig might do good missionary work in this direction, particularly if they are in a position to give consumers some assurance that the matter has some elements of permanency.

Valley News.

The Brown-Bonnell Iron Company of Youngstown, Ohio, are making extensive improvements at their mills. Their Phoenix blast furnace is being relined and refitted; a new bar mill and a new 10-inch mill will be erected. Two new iron structures 220 feet long and 60 feet wide will be built, connected by a building 50 x 60 feet. These new mills will be the combined form, the patent of Supt. John I. Williams, and will contain four heating furnaces with boilers, two vertical engines for driving the rolls and two engines for driving the shears. Each mill will occupy a separate building and the engines will be in the connecting building. All the single furnaces in their No. 1 mill are being torn down and replaced with double ones with boilers. A part of this mill will resume work in a few days. It is expected that the new structures will be completed in six weeks and the new departments ready to run next January.

The new Mattie furnace, belonging to the Girard Iron Company, Girard, Ohio, is making a splendid run, making over 200 tons daily of first-class mill iron. It is one of the finest furnace plants in the State.

The difficulty existing between the Mahoning Valley Iron Company of Youngstown and Coleman, Shields & Co., Niles, Ohio, is not yet settled. A committee of workmen was appointed from each mill to visit the plate and jobbing mills of Pittsburgh and vicinity and ascertain what mills were classified as plate mills, as their employers claim that there are mills in Pittsburgh running on the basis they desire. The committees have returned and made a report to their respective Amalgamated Association lodges, but it is feared that they are not in favor of accepting the company's proposition to run on the plate mill basis. The men claim that there are many things in connection with the Pittsburgh plate mills that are unlike the ones in this valley, and they do not feel disposed to adopt the figures paid for the same class of work in Pittsburgh. These mills have lost nearly six months time this year, and it is feared that it will be a long time ere they will resume work.

The Salem Garfield Mining Company of Goshen, Ohio, have made a sale of 1,000,000 bricks to a Detroit firm, and shipments are being made as fast as cars can be procured. The company intend putting a repress brick machine in their works.

The Tod Furnace of the Youngstown Steel Company was blown out last week after a remarkable three years' run. A new lining is being built, and the furnace will be ready to start again by the last of November. Their washed metal plant is running and making 50 tons of metal each turn.

An Increased Iron Output.

A Further Reduction in Stocks.

As already foreshadowed by the improvement in the demand for Connellsville coke, there has been an increase in the productive capacity among the coke furnaces north of the Ohio River, and there has also been a recovery in the production of anthracite pig iron. In round figures the increase amounts to 7500 tons weekly, or say 32,500 tons a month. Our stock reports indicate, however, a much heavier decline in the amount of accumulated iron, the figure being 85,000 tons. It is evident, therefore, that even with the larger current output, further inroads into stocks are being made, if the consumption now is equal to that of last month. We believe that every observer of current events in the leading markets will agree that there has been no abatement in the amount of metal melted by founders, puddling mills and steel works, so that it is quite safe to state that statistically the industry is getting into better and better condition.

The weekly product of all the furnaces on August 1 compared as follows with that of preceding periods:

| | Furnaces in blast. | Capacity per week. Gross tons. |
|-----------------------|--------------------|--------------------------------|
| October 1, 1892..... | 236 | 158,027 |
| September 1..... | 236 | 151,648 |
| August 1..... | 238 | 155,136 |
| July 1..... | 254 | 169,151 |
| June 1..... | 269 | 173,674 |
| May 1..... | 268 | 177,886 |
| April 1..... | 280 | 185,462 |
| March 1..... | 305 | 193,902 |
| February 1..... | 308 | 187,383 |
| January 1..... | 305 | 188,062 |
| December 1, 1891..... | 298 | 188,135 |
| November 1..... | 304 | 187,085 |
| October 1..... | 306 | 181,615 |
| September 1..... | 299 | 170,846 |
| August 1..... | 296 | 169,576 |
| July 1..... | 293 | 171,115 |
| June 1..... | 258 | 146,782 |
| May 1..... | 267 | 115,590 |
| April 1..... | 228 | 113,483 |
| March 1..... | 257 | 134,326 |
| February 1..... | 294 | 146,060 |
| January 1..... | 302 | 167,599 |
| December 1, 1890..... | 340 | 183,846 |
| November 1..... | 342 | 177,938 |
| October 1..... | 336 | 179,263 |
| September 1..... | 323 | 171,776 |
| August 1..... | 324 | 164,798 |
| July 1..... | 336 | 175,727 |
| June 1..... | 345 | 180,791 |
| May 1..... | 344 | 180,090 |
| April 1..... | 344 | 178,474 |
| March 1..... | 345 | 180,991 |
| February 1..... | 334 | 173,051 |
| January 1..... | 333 | 174,098 |
| December 1, 1889..... | 328 | 169,151 |
| November 1..... | 323 | 165,225 |
| October 1..... | 311 | 151,067 |
| September 1..... | 294 | 134,068 |
| August 1..... | 286 | 145,890 |
| July 1..... | 285 | 141,419 |

It may be worthy of remark that the number of active furnaces possesses no significance whatever. This will readily be appreciated when the fact is considered that there are furnaces making 70 and 80 tons a week, while others produce 1700 tons in the same time.

The condition of the anthracite furnaces was as follows:

Anthracite Furnaces, October 1.

| Location of furnaces. | Total number of stacks. | Number in blast. | Capacity per week. | Number out of blast. | Capacity per week. |
|-------------------------------|-------------------------|------------------|--------------------|----------------------|--------------------|
| New York..... | 19 | 5 | 2,220 | 14 | 5,424 |
| New Jersey..... | 12 | 3 | 1,023 | 9 | 2,510 |
| Spiegel..... | 3 | 2 | 117 | 1 | 73 |
| Pennsylvania: | | | | | |
| Lehigh Valley..... | 46 | 26 | 9,688 | 20 | 7,210 |
| Spiegel..... | 1 | 0 | 0 | 1 | 56 |
| Schuylkill Valley..... | 30 | 11 | 5,337 | 19 | 7,730 |
| U. S. Susquehanna Valley..... | 16 | 6 | 1,888 | 10 | 2,075 |
| L. S. Susquehanna Valley..... | 17 | 7 | 4,483 | 10 | 2,430 |
| Lebanon Valley..... | 15 | 9 | 4,503 | 6 | 2,362 |
| Totals..... | 159 | 60 | 29,958 | 90 | 29,879 |

For a number of months past our records of active anthracite furnaces show the following:

| | Furnaces in blast. | Capacity per week. |
|-----------------------|--------------------|--------------------|
| October 1, 1892..... | 69 | 29,958 |
| September 1..... | 66 | 27,453 |
| August 1..... | 66 | 28,821 |
| July 1..... | 72 | 31,754 |
| June 1..... | 76 | 33,209 |
| May 1..... | 81 | 35,473 |
| April 1..... | 84 | 36,487 |
| March 1..... | 89 | 38,678 |
| February 1..... | 91 | 38,124 |
| January 1..... | 94 | 39,307 |
| December 1, 1891..... | 85 | 34,905 |
| November 1..... | 87 | 35,802 |
| October 1..... | 85 | 32,459 |
| September 1..... | 82 | 31,214 |
| August 1..... | 82 | 32,890 |
| July 1..... | 91 | 36,561 |
| June 1..... | 90 | 35,331 |
| May 1..... | 91 | 36,598 |
| April 1..... | 93 | 38,543 |
| March 1..... | 98 | 40,212 |
| February 1..... | 101 | 43,166 |
| January 1..... | 105 | 43,474 |
| December 1, 1890..... | 104 | 42,141 |
| November 1..... | 100 | 38,627 |
| October 1..... | 104 | 39,115 |
| September 1..... | 106 | 41,013 |
| August 1..... | 112 | 42,543 |
| July 1..... | 117 | 45,142 |
| June 1..... | 123 | 46,912 |
| May 1..... | 119 | 46,110 |
| April 1..... | 115 | 45,790 |

One of the Hudson furnaces stopped on the 25th ult., and Oxford, in New Jersey, also went out last month. Warwick, remodeled and newly equipped, again entered the list of active furnaces, but Chester, which we group with the Schuylkill Valley stacks, stopped running early in September. Bethlehem, in the Lehigh Valley, records the starting of one additional stack, and in the Lebanon Valley two furnaces resumed.

The status of the coke furnaces on the 1st inst. was:

Coke Furnaces, October 1.

| Location of furnaces. | Total number of stacks. | Number in blast. | Capacity per week. | Number out of blast. | Capacity per week. |
|----------------------------------|-------------------------|------------------|--------------------|----------------------|--------------------|
| New York..... | 6 | 3 | 3,326 | 3 | 1,551 |
| Pennsylvania: | | | | | |
| Pittsburgh district..... | 24 | 19 | 28,427 | 5 | 5,682 |
| Spiegel..... | 1 | 0 | 2,000 | 0 | 0 |
| Shenango Valley..... | 18 | 6 | 5,991 | 12 | 9,130 |
| Junata and Conemaugh Valley..... | 17 | 8 | 6,150 | 9 | 3,860 |
| Spiegel..... | 1 | 0 | 0 | 1 | 465 |
| Youghiogheny Val..... | 3 | 0 | 0 | 3 | 2,215 |
| Miscellaneous..... | 4 | 1 | 611 | 3 | 1,078 |
| Maryland..... | 5 | 1 | 1,367 | 4 | 4,470 |
| West Virginia..... | 1 | 0 | 0 | 1 | 250 |
| Wheeling District..... | 9 | 6 | 6,726 | 3 | 1,815 |
| Ohio: | | | | | |
| Mahoning Valley..... | 15 | 8 | 8,086 | 7 | 5,240 |
| Central & Northern..... | 11 | 7 | 5,789 | 4 | 3,130 |
| Hocking Valley..... | 12 | 1 | 664 | 11 | 2,950 |
| Hanging Rock..... | 15 | 8 | 1,436 | 7 | 1,926 |
| Indiana..... | 2 | 0 | 0 | 2 | 430 |
| Illinois..... | 18 | 12 | 18,454 | 6 | 6,250 |
| Spiegel..... | 1 | 0 | 0 | 1 | 1,153 |
| Wisconsin..... | 4 | 3 | 2,240 | 1 | 600 |
| Missouri..... | 6 | 1 | 690 | 5 | 2,740 |
| Minnesota..... | 1 | 0 | 0 | 1 | 700 |
| Colorado..... | 3 | 2 | 1,070 | 1 | 506 |
| The South: | | | | | |
| Virginia..... | 30 | 12 | 7,184 | 8 | 4,238 |
| Kentucky..... | 4 | 2 | 650 | 2 | 550 |
| Alabama..... | 38 | 20 | 14,533 | 18 | 9,540 |
| Tennessee..... | 13 | 6 | 3,781 | 7 | 2,330 |
| Georgia..... | 2 | 0 | 0 | 2 | 1,045 |
| North Carolina..... | 1 | 0 | 0 | 1 | 94 |
| Totals..... | 256 | 128 | 118,895 | 128 | 72,888 |

As compared with previous months, the active coke furnaces make the following showing:

| | Furnaces in blast. | Capacity per week. |
|-----------------------|--------------------|--------------------|
| October 1, 1892..... | 128 | 118,895 |
| September..... | 128 | 114,538 |
| August 1..... | 131 | 117,984 |
| July 1..... | 140 | 127,433 |
| June 1..... | 145 | 128,852 |
| May 1..... | 147 | 132,313 |
| April 1..... | 152 | 138,116 |
| March 1..... | 163 | 143,490 |
| February 1..... | 167 | 138,288 |
| January 1..... | 163 | 138,611 |
| December 1, 1891..... | 162 | 142,747 |
| November 1..... | 162 | 142,152 |
| October 1..... | 163 | 135,997 |
| September 1..... | 161 | 127,664 |
| August 1..... | 154 | 125,736 |
| July 1..... | 150 | 122,422 |
| June 1..... | 124 | 100,165 |
| May 1..... | 98 | 70,529 |

| | | |
|-----------------------|-----|---------|
| April 1..... | 96 | 67,570 |
| March 1..... | 113 | 85,088 |
| February 1..... | 125 | 94,473 |
| January 1..... | 143 | 112,153 |
| December 1, 1890..... | 108 | 127,634 |
| November 1..... | 168 | 122,555 |
| October 1..... | 170 | 127,247 |
| September 1..... | 156 | 119,757 |
| August 1..... | 150 | 113,040 |
| July 1..... | 163 | 120,673 |
| June 1..... | 167 | 123,340 |
| May 1..... | 160 | 123,489 |
| April 1..... | 173 | 121,560 |
| March 1..... | 169 | 122,585 |
| February 1..... | 169 | 118,588 |
| January 1..... | 169 | 119,396 |
| December 1, 1890..... | 162 | 116,319 |
| November 1..... | 160 | 112,289 |
| October 1..... | 154 | 102,454 |
| September 1..... | 141 | 98,744 |

The Pittsburgh district is beginning to show greater activity. One of the Lucy furnaces which was idle for some time resumed in September. Edith, of the Oliver Iron and Steel Company, and two of the Isabella, are to start this month. One of the Edgar Thomson stacks was put on spiegel last month. The Shenango Valley records the blowing in of one Stewart. In the Mahoning Valley Brier Hill was stopped, and Mary was not running on the 1st inst. Hannah, however, has gone in. The Illinois Steel Company put out one Chicago and one South Chicago furnace in September. Belfont, in the Hanging Rock region, is again at work, and Missouri has at last again entered the list of coke iron producing States through the resumption of Missouri Furnace.

The principal changes in the South have been in Virginia, where one Crozer and one Longdale have resumed. Alabama records a somewhat larger product, with the same plants running. In Tennessee, Rockwood is out.

The charcoal furnaces at work had the following capacity:

Charcoal Furnaces, October 1.

| Location of furnaces. | Total number of stacks. | Number in blast. | Capacity per week. | Number out of blast. | Capacity per week. |
|-----------------------|-------------------------|------------------|--------------------|----------------------|--------------------|
| New England..... | 13 | 4 | 320 | 9 | 640 |
| New York..... | 5 | 2 | 376 | 3 | 210 |
| Pennsylvania..... | 13 | 3 | 170 | 10 | 770 |
| Maryland..... | 1 | 1 | 136 | 0 | 600 |
| Virginia..... | 13 | 0 | 0 | 13 | 827 |
| Ohio..... | 9 | 6 | 400 | 3 | 253 |
| Kentucky..... | 3 | 0 | 0 | 3 | 935 |
| Tennessee..... | 2 | 4 | 1,096 | 3 | 350 |
| Georgia..... | 3 | 1 | 279 | 2 | 320 |
| Alabama..... | 13 | 4 | 1,277 | 9 | 1,810 |
| Michigan..... | 20 | 9 | 3,214 | 11 | 3,040 |
| Missouri..... | 4 | 1 | 337 | 1 | 292 |
| Wisconsin..... | 4 | 2 | 1,131 | 2 | 465 |
| Texas..... | 4 | 1 | 174 | 3 | 730 |
| Washington..... | 1 | 0 | 0 | 1 | 170 |
| Oregon..... | 1 | 1 | 225 | 0 | 0 |
| Totals..... | 118 | 39 | 9,174 | 79 | 11,412 |

As compared with previous months, the record of active charcoal furnaces stands as follows:

| | Furnaces in blast. | Capacity per week. |
|-----------------------|--------------------|--------------------|
| October 1, 1892..... | 39 | 9,174 |
| September 1..... | 42 | 9,657 |
| August 1..... | 41 | 8,331 |
| July 1..... | 42 | 9,964 |
| June 1..... | 48 | 11,613 |
| May 1..... | 40 | 10,100 |
| April 1..... | 44 | 10,859 |
| March 1..... | 50 | 11,734 |
| February 1..... | 49 | 10,991 |
| January 1..... | 48 | 11,164 |
| December 1, 1891..... | 52 | 11,033 |
| November 1..... | 55 | 11,731 |
| October 1..... | 58 | 12,159 |
| September 1..... | 56 | 11,988 |
| August 1..... | 54 | 10,980 |
| July 1..... | 50 | 10,801 |
| June 1..... | 44 | 10,056 |
| May 1..... | 39 | 9,730 |
| April 1..... | 41 | 9,295 |
| March 1..... | 51 | 10,890 |
| February 1..... | 56 | 11,365 |
| January 1..... | 59 | 12,280 |
| December 1, 1890..... | 67 | 12,728 |
| November 1..... | 70 | 13,262 |
| October 1..... | 66 | 12,389 |
| September 1..... | 63 | 12,904 |
| August 1..... | 59 | 10,745 |
| July 1..... | 61 | 12,511 |
| June 1..... | 61 | 12,312 |

| | | |
|-----------------------|----|--------|
| May 1..... | 52 | 10,608 |
| April 1..... | 52 | 10,804 |
| March 1..... | 59 | 12,606 |
| February 1..... | 58 | 11,378 |
| January 1..... | 59 | 11,485 |
| December 1, 1890..... | 66 | 12,779 |
| November 1..... | 67 | 12,888 |
| October 1..... | 63 | 12,047 |
| September 1..... | 60 | 11,327 |

There have blown out, during September, Mount Vernon in Ohio and Fond du Lac in Wisconsin.

Stocks.

The movement of stocks continues downward, the figure having dropped to 852,648 tons for all kinds, sold and unsold, on October 1, or 85,234 tons less than a month ago, the same furnaces being represented in both instances. Coke producers report to us 490,948 tons, or 62,971 tons less than on September 1; the report of charcoal furnaces aggregates 208,135 tons, a reduction from last month of 18,469 tons, while the anthracite furnaces which send us data carry 153,565 tons, or 3994 tons less than a month since. Of the reduction in charcoal stocks, over 11,000 tons is traceable to Michigan, where the figures have fallen to 64,668 tons.

The reductions in coke stocks in the principal producing districts are shown in the following table:

| District. | Stock, Oct. 1, 1892. | Stock, Sept. 1, 1892. | Decrease. |
|----------------------------|----------------------|-----------------------|-----------|
| Shenango Valley, Pa..... | 61,942 | 86,982 | 25,040 |
| Mahoning Valley, O..... | 60,805 | 69,884 | 9,079 |
| Alabama..... | 68,539 | 73,759 | 5,220 |
| Tennessee and Georgia..... | 76,698 | 80,411 | 3,713 |
| Virginia..... | 68,970 | 71,653 | 2,683 |
| Hanging Rock region..... | | | |
| Ohio..... | 16,581 | 17,142 | 561 |
| Illinois..... | 28,159 | 28,555 | 196 |

It must be borne in mind that our stock reports do not cover the holdings of the large steel companies.

The Elimination of Sulphur from Iron.*

Sulphur in the Material.

COKE AND COAL.

Sulphur exists in two conditions naturally in coal—1, in greatest proportion in the pyrites or bisulphide of iron, and, 2, in sulphate of lime. Some coals are free from the latter substance, but I have met with coal containing as much as 1 per cent., equal to 0.23 per cent. sulphur. During the process of coking half of the sulphur is driven off from the pyrites, but that in the lime sulphate is all retained. It is, therefore, a disadvantage to have sulphate of lime in coal which is required for making furnace coke, but a decided advantage if the coal has to be burned in an open fire or the fire grate of a steam boiler, for the sulphur present in the sulphate is retained in the ash, and none of it escapes into the atmosphere. During the last 20 years the amount of sulphur, on an average, has been in the best English coals gradually increasing. Twenty years ago the sulphur in best average Durham furnace coke used in Cleveland district was not above 0.80 per cent., and the furnace manager considered himself badly used if a coke containing 1 per cent. was sent to his works. To-day the average used in Cleveland contains about 0.95 per cent. sulphur, and coke with 1.25 per cent. is often used. Crushing and washing the coal results in the removal of a very large proportion of the heavy pyrites, and many coals are now by that means so well cleansed as to give a coke well suited for furnace work, which, without washing, would have been utterly useless for that purpose. The removal of sulphur from coal is effected, therefore, in only two ways—1, by washing out the pyrites; 2, during the coking process.

* Read at the Liverpool meeting of the Iron and Steel Institute.

IRON ORE.

The exceedingly low price of pig iron, and the small profits derived by its manufacture, prohibit the use of expensive processes for the removal of sulphur from the ores. There are only two processes in general use—viz., 1, the method used in America, and only applicable to magnetic ores containing pyrites—viz., the separation by magnetic machines; 2, by calcination. By the first method mentioned it is necessary to crush the ore to fine powder, to pass it afterward through the magnetic machines, by which means not only are the pyrites separated, but all other substances (such as silica, phosphate of lime, &c.) which are not attracted by the magnet. The ore prepared in this way of course remains in fine powder, and is not in a condition such as we in England care to have it, for our experience with purple ore shows us that when used in large quantities it has a tendency to check the driving in the blast furnace, and that the furnace flues are soon filled with the powder carried over mechanically with the gas. About 22 years ago a cargo of Marbella ore sand was sent to the Witton Park Works. The condition was exactly similar to "magnet" cleaned ore. About 25 per cent. of this cargo was charged with 75 per cent. of good Spanish ore into a furnace 75 feet high, working with blast at 3½ pounds pressure. The result was not satisfactory; the blast refused to pass through the mass with any reasonable speed, and, as a consequence, the furnace was nearly "gobbed" up, and it was with the greatest difficulty it was got into working order again after removing the cause of mischief. The blast in this case was certainly not great, and I can only account for the reported success in using crushed ore in American furnaces, because the blast pressure is so much greater. We must not, however, forget that if one evil is reduced by increased blast pressure, the other is likely to be increased, and a correspondingly larger proportion of fine ore be carried into the flues. Looking at the question from every point, I am of the opinion that if crushed ores freed from pyrites, &c., must be used, large dust collectors should be attached to the "down-comers," and our furnaces must be worked at greater pressure than is usual in this country, to obtain satisfactory results. Calcination is the most generally adopted method of removing sulphur from ore. At Colebrook, in America, the magnetic ore used in the furnaces is calcined in kilns heated by gas, by which means the sulphur originally present is reduced by 50 per cent. Purple ore bricks are an instance of the effect of repeated calcination, with free exposure to air, upon iron pyrites, which contains about:

| | Per cent. |
|-----------------|-----------|
| Iron..... | 45.0 |
| Sulphur..... | 50.0 |
| Copper..... | 2.5 |
| Silica, &c..... | 2.5 |
| Total..... | 100.0 |

The greater part of the sulphur is removed in the "sulphur burner," where it combines with oxygen, and passes into sulphurous acid (more correctly called sulphur dioxide), and is eventually converted into sulphuric acid. When the burnt ore is "drawn," the whole of the original copper, together with 3 to 6 per cent. of sulphur, remains. In this condition it is sent to the copper works, where it is ground to powder, mixed with common salt, and calcined in a reverberatory furnace, in an oxidizing atmosphere, by which means the sulphides are oxidized to sulphates. By washing, the sulphates of copper and other soluble sulphates are removed, and the washed ore, containing 16 to 18 per cent. of water, 0.40 to 0.50 per cent. sulphur, and 0.08 per cent. copper, constitutes ordinary purple ore, or "Blue Billy." The

sulphur is further reduced to under 0.10 per cent. during the manufacture of bricks, in which, after molding to suitable shapes, they are baked in a brick kiln. If the ores subjected to calcination contain carbonate of lime, its presence is liable to prevent the expulsion of the sulphur by calcination. Thus, in a careful observation made at Eston in calcining Cleveland ironstone, which contained under 0.30 per cent. sulphur, the carbonate of lime present was decomposed and the free lime absorbed the sulphur dioxide at first produced in the oxidizing atmosphere of the kiln, sulphate of lime was produced, and not only was no sulphur removed, but it was actually increased; the sulphur from the small coal used for calcining was to a certain extent retained by the lime of the ironstone. The practice of calcining ironstone and limestone together must result in the prevention of the escape of sulphur dioxide. Sulphates of baryta and lime—in fact, sulphur in every form charged into a blast furnace—are equally liable to be retained in the pig iron, for reasons which will be discussed hereafter. There is no method of removing such sulphates from the ore before smelting, excepting by "dressing" and hand picking, and this is only practicable when the white sulphates are not diffused or mixed throughout the material.

Removing Sulphur from Iron in the Blast Furnace.

The following general facts have been so often verified they may be accepted without doubt: 1. That when sufficient lime is present in the furnace-charge to combine with all the sulphur and acid (silica), the temperature being sufficiently high, practically all the sulphur will be found in the slag, and little or none in the metal; 2. that if other things remain constant, as the temperature falls, so as to result in pig iron of closer texture or higher number, the sulphur gradually increases with the increasing number, till eventually, when the temperature of the furnace is just sufficient to melt the iron reduced, the greater part of the sulphur will be found in the pig, and little be present in the slag; 3. that the more basic the slag the less sulphur will eventually be retained in the pig iron; 4. that if manganese is charged with the materials, if the temperature is high enough, less sulphur will pass in the iron, and a proportionately greater amount be found in the slag. Mr. Parry, Ebbw Vale, was, I believe, the first to notice this fact. It has since been constantly taken advantage of in producing basic iron in the Cleveland and other districts. Practically, all the sulphur charged into a blast furnace in the ore before it reaches the hearth must at one time during its descent have combined with the iron.

THE EFFECT OF MANGANESE IN THE BLAST FURNACE.

As has been before stated, it would appear that Parry, Ebbw Vale, first noticed the coincidence that when manganese ores were used in a blast furnace sulphur was exceedingly low in the pig and correspondingly high in the slag. Caron observed the same phenomenon, and since then it has been repeatedly confirmed and taken advantage of for the purpose of making iron low in sulphur. Akermann, in discussing the reason why manganese should have this valuable property, considers that it drags sulphur into the slag even more powerfully than calcium does. The opinion has been expressed by another gentleman that the manganese in pig iron abhorred sulphur, and the two could not exist together; therefore, as manganese was the stronger element, it expelled the sulphur. Mr. Snelus explained the effect of manganese by assuming that it was the oxide in the slag which, combining with

the silica, allowed the lime to act upon and carry off the sulphur. Howe, in discussing this question, says that manganese in some cases actually removes sulphur from iron (probably because sulphide of manganese, like sulphide of calcium, is less soluble in metallic iron than sulphide of iron is) by forming some compound rich in sulphur and manganese, which liquates or separates by gravity. This deduction of Mr. Howe is evidently based on the results obtained by Caron, Riley, Ponsard, Walrand and Ledebur, all of whom proved that when manganese is added to sulphurous iron in a liquid state it causes a separation of sulphur from the mixture. Ledebur found that the drop-like masses separate from liquid cast iron and float on the surface, and in these he found much more manganese and sulphur than in the mass of the metal. The correctness of Howe's deductions has been most perfectly demonstrated by Herr Massenez in his most valuable desulphurizing process at the Hoerde Works, where it has been practically proved that manganese does combine with sulphur, and rises by gravity in the state of manganese sulphide, when the two elements are brought together in fluid cast iron. There can be little doubt, therefore, that manganese when it is reduced in the blast furnace and enters the fluid iron containing sulphur, behaves in the same way as if added to the fluid iron after it leaves the furnace. This hypothesis takes for granted that some of the manganese is reduced, and that from 1½ to 1¼ per cent. is still retained in the metal after it leaves the furnace. When the manganese is not reduced in the furnace, but remains almost entirely in the slag, its presence in that form is valueless as a desulphurizer. This has been repeatedly proven in the manufacture of basic iron in the Cleveland district. From the above considerations we may safely grant that the effect of manganese in a blast furnace in removing sulphur depends on a portion of the manganese at first reduced entering the metal, where it combines with the sulphur, and, leaving the metal again, carries it off to the slag as sulphide of manganese. Whether or not it remains in the slag as such I am not prepared to say. There are cases on record given by Tucker and Harbord in which they had found blast furnace metal containing large amounts of both manganese and sulphur together.

| | Per cent. | Per cent. | Per cent. |
|----------------------------|-----------|-----------|-----------|
| 4 per cent. manganese..... | 2.36 | 2.54 | 1.76 |
| 2 per cent. sulphur..... | 0.20 | 0.11 | 0.42 |

Such a series of metals, we must admit, are most exceptional. It is possible the presence of so much sulphur and manganese together in the same pig iron may be accounted for by assuming that the opposite sides of the furnace in which they were smelted were producing on one side highly mangiferous iron, and on the other sulphurous iron low in manganese, and that perfect mixing had not been effected at the time the metal was tapped, and that when they eventually left the furnace sufficient time was not given to admit of the separation of the sulphide of manganese before it had become solid in the pigs. If such iron could be remelted and allowed to remain fluid for a sufficient time, in all probability separation would result. The same remarks apply to the manganese steel produced by Mr. Hadfield, in which, it will be remembered, we were told that even 10 per cent. manganese failed to reduce or carry off any of the sulphur present.

BLAST FURNACE SLAGS AND THEIR EFFECT ON IRON CONTAINING SULPHUR.

It is a very well recognized fact that the more basic a blast-furnace slag is—other things remaining constant—the greater amount of sulphur will be found in it,

and that the greater the quantity of slag, the more perfectly will it retain the sulphur. As an instance, the practice in Cleveland may be quoted. In making Cleveland pig, the ore contains 0.3 to 0.5 per cent. sulphur, and the quantity of slag per ton of pig thrown off amounts to about 30 cwt., and it is far from being very basic; and yet the metal produced contains no more sulphur than hematite iron made from ores containing practically no sulphur, which, however, is produced with much more basic slags weighing under 15 cwt. per ton. Sir L. Bell converted white iron into gray by exposing it for a long time under the hot slag which flowed from a furnace making No. 3 iron. I do not remember whether or not analyses of the material before and after treatment are on record; but I should assume that the hot slag must have removed the sulphur from the white iron.

All these experiments clearly prove what desulphurizing power slightly basic silicates possess, yet Janoyer found on the large scale in the blast furnace that "when iron pyrites existed in sensible proportion even with excess of lime he could not produce good gray iron. The sulphur in the iron was found to diminish in proportion to the amount of lime added and *ceteris paribus*, but it was impossible to add sufficient lime to effect complete desulphurization and at the same time produce a fusible slag." Unfortunately all the conditions are not recorded, and we are not told as to what quantity of pyrites was actually present. Howe says that the practice at the Illinois Iron Works proved that when dolomite (magnesium limestone) was replaced by calcite (ordinary limestone) less sulphur was found in the metal, showing that lime is a more efficient desulphurizer than magnesia. Magnesium limestone has never been used successfully in smelting Cleveland iron. Whenever a trial has been made with it, the iron has invariably changed from gray to mottled and white, and the sulphur has been increased in the pig, the slag at the same time changing in character from a free flowing to a viscous material. In the manufacture of Bessemer iron magnesium stone has given better results, but in one or two cases after a trial it was abandoned in favor of limestone. There is no objection to its use in furnaces producing spiegel and ferromanganese, as the manganese is sufficient to remove the sulphur, and there is an advantage in that the slags may be exceedingly basic and yet not disintegrate when cold. From what has been stated, it is clear that by far the most potent agencies at work in a blast furnace for the removal of sulphur are a sufficiently elevated temperature accompanied by a sufficient quantity of basic silicate of lime. So far as I know, alumina is inert as a desulphurizer, but its presence in the slag causes it to be more fluid, and makes it possible to add a greater quantity of lime without rendering the slag viscous and thick, and although not a direct agent in removing sulphur it assists indirectly in arriving at such a result.

HOW THE SULPHUR BEHAVES IN THE BLAST FURNACE.

We must now endeavor to follow the material containing sulphur from the time it is charged at the top of the furnace till it eventually comes out at the base. At first, when the temperature is considerably below redness, the sulphates of lime and baryta, if present, will not be materially affected; when it arrives at the point where the temperature approaches redness these bodies will be reduced to their respective sulphides, and at a point below this, when the temperature is high enough to produce the lowest quality of white iron capable of being fluid, whether at the tuyeres or at some distance above (the distance depending on the quality of

the iron being made), we may presume such fluid iron will have in combination with it all, or practically all, of the sulphur originally present in the ore, whether it existed in barium or calcium sulphates, or as sulphide of iron. As little of the coke is consumed before it comes in contact with the blast near the hearth, the sulphur present in it in a great measure may be considered to be so locked up, and that it is not until the carbon is burnt away that the sulphur present in it has a chance of passing into the fluid iron. Now, in proportion as the temperature is more or less elevated, so also will the reducing power of the coke or carbon be greater or less, and the higher it is the longer will be the distance above the tuyeres at which fluid cast iron is at first produced, and the greater the distance which such iron will have to travel before it reaches the hearth or well. During such passage it will be exposed to higher and still higher temperature, encountering everywhere surrounding it hot carbon, lime and basic silicates. Under circumstances like these we can readily understand how sulphur passes into the slag. If the reducing power is sufficient and the necessary quantity of lime or basic silicate is at hand, more or less of these silicates will be reduced, the silicon uniting with the iron, and the base metal will be made available for at once removing the sulphur. In this way it will be seen the conditions which favor the reduction of silica are also, if bases are present (and they almost invariably are), just the conditions necessary to remove the sulphur. Probably the sulphur from the coke, in a hot furnace, in presence of calcareous slags and intensely heated carbon, combines with the bases almost at once, and never enters the metal; for both free sulphur and sulphurous acid, if passed over a mixture of carbon and lime at a strong heat, are absorbed, calcium sulphide and carbonic oxide resulting. On the other hand, if the temperature is low, although perhaps the sulphur may be retained in the slag, the balance will be found in the metal. In making very low quality of iron its fusion point must be very near to the tuyeres; for if a furnace working in such a condition is slightly cooled below the already low temperature, the hearth will be closed up by the solidification of the metal and slag, the temperature falling in such case below the melting point of the iron. Further investigations are required to determine definitively and exhaustively the question as to the behavior of sulphur in a blast furnace—at least in so far as the chemical changes are concerned.

(To be continued.)

James J. Bennett.

(By Telegraph.)

PITTSBURGH, PA., October 11, 1892.

James J. Bennett, formerly of the firm of Graff, Bennett & Co., at one time owners and operators of the Clinton Iron & Steel Works, Clinton 'Blast Furnace' and Millvale Rolling Mills at Pittsburgh, and also president of the Pittsburgh and Lake Erie Railroad some years since, died at his residence here morning of pneumonia. Mr. Bennett had been ill only since last Friday, and his sudden death will be a surprise to his large number of friends and business associates.

E. S. Moffat has become the president and general manager, at Scranton, and Walter Scranton the vice-president of the Lackawanna Iron & Steel Company. H. S. Vultee is treasurer and J. P. Higginson the secretary of the same company. E. F. Hatfield is president of the Lackawanna Iron & Coal Company, in liquidation.

San Francisco News.

The new shops of the Fulton Iron Works are being rapidly prepared for occupancy. They will be very roomy and will be filled with machinery of the latest construction. A canal connecting with Oakland Creek is well under way, and is being pushed to completion as fast as possible. It will be ready as soon as the works are finished. The works, 750 feet from Oakland Point, will have a water frontage of 1700 feet and a depth of 2200 feet. This will give ample space for the construction of vessels of any size. It is an open secret that the company will follow the lead of the Union Iron Works and begin an active competition for the construction of vessels for the navy as soon as the shops are completed. It is said that the Risdon Iron Works contemplate a similar move. All this means increased facilities for doing all descriptions of work here; larger establishments than we have hitherto boasted of, work carried out on a grander scale, and in consequence more cheaply done. San Francisco is entering on a new era in manufactures. For many a year, with no railroad competition and with all goods paying a heavy freight tariff by sea, she, or rather her manufacturers, commanded most of the trade in certain lines. With the coming of the railroad there was a new era, and not an agreeable one, to manufacturers, as close competition with Eastern rivals had to be encountered; and, unused to anything of the kind, many of our industrial establishments had a hard time of it. We have by degrees, and with in some instances a good deal of tribulation, been getting out of the old groove. The movement has been taking the shape of larger establishments, capital of greater amount, and men of unusual intelligence and energy, well fitted to grapple with the new problems that faced them for solution. I predict that henceforth our industrial progress will be much more rapid than of yore, and being, as it will be, based on competition, will be more permanent and durable than in the days when the stage had not been superseded by the iron horse.

Business is more satisfactory than it has been for two weeks past. There has been a notable improvement, and, though but few as yet venture to say that sales are of the volume of a year ago, yet there is no doubt that they approach very near it. The clearing house exchanges afford good evidence of this. For the week ending Saturday they were \$19,270,040. For the same time a year ago they were \$19,505,679. This is the first time in a long while when our exchanges have not been seriously behind those of 1891. Our remarks have been more or less general, but they apply to hardware, &c., as much as to aught else. For the next three months a very good business is looked for; and this, of course, means a good business in metals more especially. When iron and its products are dull in the markets of the world there is little else that is active. The falling off in the number of buildings started in the city has been, of course, a loss to the hardware trade, as building hardware and iron form quite a goodly part of the trade. Judged by this we are improving now, but had been retrogressing. For the first nine months of 1891 the number of new buildings started was 847 as against 1189 for the same time in 1891. This is a very considerable reduction, and the values show even a greater falling off. However, the new buildings for the month of September were 114—for the same month last year, 119. The country trade has improved much as well as has the city trade, and it looks as if we were now on the opening of a better time in a business than we have enjoyed for quite a while.

MANUFACTURING.

Iron and Steel.

As announced in a previous issue, the Mahoning Valley Iron Company of Youngstown, Ohio, have purchased the plant of the Hubbard Iron Company, located at Hubbard, Ohio, and will hereafter operate it as a part of their establishment. The business of the Mahoning Valley Iron Company is increasing very rapidly, and the firm decided that they could use the product of the Hubbard mill to good advantage in connection with their Youngstown plant, and this is given as the reason the purchase was made. The Youngstown and Hubbard plants will give the Mahoning Valley Iron Company a monthly capacity of 6000 tons. Some changes will probably be made in the Hubbard plant to more easily adapt the mill to the class of goods made by the Youngstown mill, but these changes will be made in the future as occasion may require.

A report is going that the rollers and beaters employed in the rolling mills of the Mahoning Valley are considering the advisability of withdrawing from the Amalgamated Association. It is stated that it is the intention of the men to form a new organization, the membership to include rollers and beaters employed in the mills in the Mahoning and Shenango valleys, and this new association will treat with the manufacturers of the above places in the same manner as the Amalgamated Association has met them in the past. There is no doubt of the fact that considerable dissatisfaction exists at the present time in the ranks of the Amalgamated Association, and this move on the part of the men in the Mahoning Valley is an outcome of it.

Last week a large part of the fence built around the Homestead Steel Works in June last, or before the commencement of the Homestead strike, was torn down. The Carnegie Steel Company, Limited, state that the reason for tearing down the fence is that, so far as they are concerned, the strike is over and they desire operations continued in the same manner as they were previous to the strike.

A large number of men formerly employed at the Edgar Thomson Steel Works of the Carnegie Steel Company, Limited, at Braddock, Pa., but who were thrown out of work at that place by the introduction of improved machinery, are making preparations to go to New Castle, Pa., for the purpose of taking situations in the new Bessemer steel plant of the Shenango Valley Steel Company, which will be put in operation at an early date. In addition a large number of the men formerly employed at the Homestead Steel Works have also gone to New Castle for a similar purpose.

The Old Aetna Iron Works, at Crown Point, Ind., may be converted into a factory for the manufacture of steel castings.

The Scottdale Iron and Steel Company of Scottdale, Pa., manufacturers of iron and steel sheets, have erected two pairs of squaring shears with engines attached, and will have them in operation within the next ten days. These shears will be used for squaring sheets in the pack and are capable of cutting up to $\frac{1}{4}$ inch thick and 120 inches long.

To the Laughlin Nail Company, Wheeling, W. Va., whose nail factory is located at Martin's Ferry, Ohio, belongs the credit of being the largest producers of cut nails in this country at the present time. For the week ending October 1 the production of this concern was 11,500 kegs, the largest production for a similar period being 11,300 kegs. During the month of September the shipments of nails by this firm exceeded 50,000 kegs. Their nail factory contains 225 nail machines and is one of the best equipped in this country, shipments being made to every point of consumption in the United States.

The galvanizing plant now being erected by the Riverside Iron Works, at Wheeling, W. Va., reference to which has already been made in these columns, is rapidly approaching completion. This firm have just commenced excavating for the foundation for a new 28-inch plate mill, the dimensions of which will be 80 x 240 feet. Steubenville Furnace, at Steubenville, Ohio, owned by this concern, which has been idle for some time, may possibly resume blast in the near future.

An experimental trial of the new sheet mill plant recently completed by the Standard Iron Company, at Bridgeport, Ohio, was had on last week. A few sheets only were rolled, but a sufficient number was turned out to show that everything was in good working order, and the new plant will probably be put in full operation during the present week. This plant would have been in operation some time since, but starting was delayed owing to the non-arrival of some cranes which were being made at Pittsburgh. During the summer months the

battery of boilers at the plant of this firm was increased by the addition of a 100-horse-power Wheeler boiler. This design of boiler is an English patent, and is heated entirely by the waste heat from the furnace, no separate firing whatever being required. The Sharon Boiler Works, at Sharon, Pa., have the exclusive right for the manufacture of this type of boiler in this country.

The annual meeting of the stockholders of the Pennsylvania Steel Company of Steelton, Pa., was held in Philadelphia last week. The usual 6 per cent. semi-annual dividend was declared payable on and after October 15. The following directors were elected to serve the ensuing year: Luther S. Bent, Edmund Smith, H. H. Houston, William M. Spackman, Eben F. Barker, Charlemagne Tower, Jr., and Hon. Wayne MacVeagh. The old officers were re-elected, as follows: President, Luther S. Bent; vice-president, Eben F. Barker; secretary and treasurer, Edmund N. Smith. On Saturday, October 8, the sum of \$83,400 was distributed among the workmen in the employ of the above firm for two weeks' pay.

At a meeting of the members of the four lodges Nos. 35, 107, 114 and 128 of the Amalgamated Association employed by the Catsaqua Mfg. Company, Catsaqua, Pa., held on Saturday evening, October 1, it was decided to declare the strike at the above plant, which was ordered on July 1, 1891, off. After a contest lasting 15 months, the Amalgamated Association have been signally defeated, and the men have declared the strike off, which privileges them to return to work and still retain their membership in the organization. This strike was instituted by 330 members of the above association on account of the firm refusing to accede to their demands on July 1 of last year. The men presented a scale which the firm refused to sign and at the same time refused to recognize the Amalgamated Association in any manner whatever. As a consequence of this, the mills were closed for some weeks, while new men were being secured. Mills A and C at Catsaqua were reopened and operated more or less successfully ever since. The strikers asserted that they had \$40,000 to spend in the contest and commenced a system of interference with new men which in many cases resulted in arrests and convictions for riot and unlawful assembly. During the long time that the strike was in force the officials of the company held to the original decision authorized by the Board of Directors, and the discontinuance of the strike will facilitate complete resumption. Many of the men will be given work as individuals, while others will never again be employed by the firm.

The iron works of Morris, Tasker & Co., in Philadelphia, are about to transfer a portion of their manufacturing department to another locality, the present site having been condemned for a public square, and the probability seems to be that they will remove the entire plant to New Castle, Del., where their later Delaware Iron Company's mills cover about 60 acres.

Edith Furnace, at Allegheny, Pa., owned and operated by the Oliver Iron and Steel Company of Pittsburgh, which has been idle for some time undergoing repairs, will resume blast about the 15th inst.

One of the Lucy furnaces of the Carnegie Steel Company, Limited, at Pittsburgh, which has been idle for some time, resumed blast during the latter part of September.

The Cleveland Steel Casting Company have been incorporated at Cleveland, Ohio, with a capital stock of \$100,000. Among those interested in the new concern are N. F. Bowler and Wm. Balkwill of Bowler & Company, founders of Cleveland; J. V. Kennedy, C. B. Herig and Chas. A. Parsons. The new firm will erect works in Cleveland and engage in the manufacture of iron and steel castings.

The Eagle Iron & Steel Company of Ironton, Ohio, manufacturers of bar and sheet iron, light iron and steel-rails, have decided to increase their puddling capacity, and will try the experiment of a double puddling furnace, which is now being erected. Two porcupine boilers will also be added, each with 100 horse-power capacity, and one will be connected with the new double furnace in such a way that it will require no coal to fire the boiler. The other boiler will be similarly located in another part of the plant.

As yet the difficulty existing for some time between the Mahoning Valley Iron Company of Youngstown and the Coleman Shields Company of Niles, Ohio, and their employees has not been settled. A committee of men employed in each mill recently visited the plate and jobbing mills in Pittsburgh and vicinity for the purpose of finding out what mills were classified as plate mills, as their employers had claimed that there are mills in Pittsburgh run on the basis they desire. After an investigation the men reported to their employers that there were

some features in connection with Pittsburgh plate mills that are dissimilar to those in the Mahoning Valley, and for this reason they are not inclined to accept the wages paid for the same class of work in Pittsburgh. At present a settlement of the difficulty which has kept the above plants idle for some months seems as far off as ever.

The Everett Furnace, at Everett, Pa., has again resumed operations.

Citico Furnace, at Chattanooga, Tenn., is being relined.

Hannah Furnace, owned by the Mahoning Valley Iron Company, of Youngstown, Ohio, has been relighted after undergoing extensive repairs.

A bill has been filed in the United States Court at Knoxville, Tenn., by the Central Trust Company of New York against the Virginia, Tennessee & Carolina Steel and Iron Company. John C. Haskell has been appointed receiver in accordance with a petition in the bill. The company own about 200,000 acres of land in the three States, and owe the Central Trust Company about \$50,000.

Ground has been broken at Worcester, Mass., for two of the four buildings which will comprise the new plant of the Rice, Barton & Fales Machine and Iron Company. The machine shop will be 283 x 80 feet in size, the foundry 223 x 80 feet, a pattern house 100 x 40 feet and a stock shed 223 x 30 feet. It is hoped to have all the buildings roofed by January 15. The plant will be occupied as soon as completed.

Work has been commenced by the East Tennessee, Virginia & Georgia Railroad on the side tracks for the Carnegie Furnace at Johnson City, Tenn., and it is stated that the furnace will soon go into blast, as one of the promoters of the enterprise has raised \$100,000 for working capital.

A meeting of the bondholders, stockholders and creditors of the Fort Payne Coal & Iron Company, Fort Payne, Ala., has been called for October 20, at Boston, Mass. W. K. Sheldon states that an effort will be made to put the company in good shape.

The new furnace of the Rockdale Iron Company in Murray County, Tenn., was sold recently to satisfy a judgment for \$8000. The property now lies idle. It is a valuable plant and well located on a railroad.

It is stated that the Gadsden Iron Company's furnace will soon be put in blast by the lessees, Nixon Brothers of Atalla, Ala. The ore for this furnace is furnished by the O'Connell mines at Atalla, which are also leased by the same parties.

The United States Car Company, successors to the United States Rolling Stock Company, are making active preparations for the resumption of work at their plants at Anniston and Decatur, Ala.

D. A. Chenoweth is interested in a movement looking to the erection of a steel rail mill at Kanawha City, W. Va.

The Reading Rolling Mill of Reading, Pa., has received the contract for the structural iron for a 17-story office building in Chicago, requiring 1500 tons of structural iron. The mill is now running double turn and has over 700 men on the pay rolls.

The Benjamin Atha & Illingworth Company of Newark, N. J., have recently enlarged their steel foundry by adding to the buildings, and have also put in 20-ton electric crane and a number of tools for preparing castings for the market. It is expected that these additions will about double the capacity of this department.

It is announced that sufficient capital has been raised to complete the unfinished plant of the Watts Iron & Steel Company, at Middlesborough, Ky. It is said that the plant has already cost \$1,800,000, and that \$200,000 will complete the work.

Machinery.

The Merrill Thermo-Valve Company of Pittsburgh have a contract for furnishing burners for a battery of four boilers, aggregating 500 horse-power, for the Wheeling Natural Gas Company in their new pumping station at Buffalo Village, Washington County, Pa. The special feature claimed for this burner is its ability to run on a low pressure, thereby insuring complete combustion of all gas going through the burner.

The Beckett Smoke Consuming Company have been organized at Toledo, Ohio, with a capital stock of \$20,000, for the purpose of manufacturing and dealing in smoke consumers.

A. B. Pitkin Machinery Company, Providence, R. I., New England agents for Menasha Wood Split Pulley Company, Orr & Sem-bower, W. H. Nicholson & Co., and others, have opened a branch store at Oliver and Purchase streets, Boston, Mass., where they oc-

cupy two floors covering about 10,000 feet of space. The new branch is in charge of the vice-president of the company, W. D. Turner, formerly with Brown & Sharpe Mfg. Company. A large line of engines, boilers and machinery will be carried in stock.

John Becker Mfg. Company, Fitchburg, Mass., are preparing to add to their well-known line of milling machines a new size, No. 4, which will be ready for the market in a short time. This concern is finding a considerable market in foreign countries, and has recently shipped machines to Norway and other points abroad.

As was recently announced, the Holly Company of Lockport, N. Y., have sold a large share of their stock to a Chicago syndicate, and the capital stock of the company has been increased to \$500,000. An option has been obtained on a favorable site at Lockport, and in the near future the works may be enlarged. The officers of the company are to remain the same.

The Goulds Mfg. Company of Seneca Falls, N. Y., have a large force of men engaged in building triple pumps, this department of their works being run night and day. The company are now completing three large pumps of this style for the water works of San Antonio, Texas. Each pump weighs $7\frac{1}{2}$ tons, and will pump 500 gallons of water a minute.

The G. A. Gray Machinery Company, Webster and Sycamore streets, Cincinnati, Ohio, have recently erected an addition to their shops 25 x 100 feet, which is to be used as a planer room and erecting shop for small machines. The productive capacity since the company located on the present site has been almost regularly increased each year until now it is four times that of the original plant. The entire works are being supplied with the very best mechanisms adapted to the company's requirements obtainable. In addition to the manufacturing department a warehouse and show rooms have been secured on Jackson street. The company report the demand for their specialty—the Gray planer—as being good.

A. H. Kerkhoff & Co., Dayton and Western avenues, Cincinnati, Ohio, have recently increased their facilities for the production of upright drills, for which the demand is reported as being constantly on the increase.

The Detroit Foundry Equipment Company, Detroit, Mich., have largely increased their capacity by moving into new works at Michigan avenue and D. B. C. & A. Railway, where with new facilities they are manufacturing the Whiting cupolas, ladles and cranes of all descriptions. They are working to their utmost capacity and report orders plentiful.

Moore & White Company, Philadelphia, have recently made and shipped to the order of S. Morgan Smith of York, Pa., maker of power-transmitting machinery, some exceptionally large couplings and clutches, including one 500 horse-power and one 200 horse-power cut-off couplings and two 300 horse-power friction clutches. Business is reported brisk at the company's works, orders for paper machinery being numerous and well distributed. New and improved machine tools are being added from time to time to the plant.

The Chandler & Taylor Company of Indianapolis, Ind., are doing considerable export business in engines and saw mill machinery. The past week they shipped an engine to Guiana, South America, and a short time previously forwarded one to the West Indies. In July they shipped a saw mill to Siberia, which was sent by way of San Francisco and Japan. The correspondence regarding this saw mill developed the pleasing fact that the Russian people so highly appreciate the assistance rendered their famine-stricken districts by the Americans that at even prices they are disposed to give preference to American goods. A curious circumstance also developed some time since with regard to their self-contained engines having a solid bed plate. A South American saw their advertisement, traveled to Indianapolis from San Francisco to order one, and stated that it was exactly what he needed, because earthquakes frequently visited his locality and sadly deranged machinery which was not thus compactly built. The company's business in September was 50 per cent. heavier than in September, 1891. For a Presidential year the volume of trade now enjoyed is unprecedented.

The Eynon-Evans Mfg. Company, Philadelphia, engineers, machinists and founders, who were incorporated on June 13, 1892, are now getting their shops into good working shape, the foundry having been in operation since last July. Their plant at Fifteenth and Clearfield streets consists of a new building of two stories, 70 x 81 feet, but additional space adjoining has been acquired and will be occupied on the first of next year, which will enable the company to extend their present

facilities very materially. The shops are well provided with Brown & Sharpe and American Tool Company's machine tools. The special lines of manufacture to be undertaken include the Eynon-Korting injector, for which the company are the patentees, also the Eynon pyrometer, blowers, ventilators, blast nozzles, exhausters, syphons, condensers, &c. The Eynon-Evans Mfg. Company are also prepared to contract for hydraulic and special machinery. Their foundry is stated to be capable of turning out brass castings up to 5000 pounds. The officers are Rollin H. Wilbur, president; Thomas M. Eynon, mechanical engineer, general manager; and Thomas Evans, secretary and treasurer.

An addition 60 x 60 feet is being built to the iron foundry of the Portsmouth Machine Company, Portsmouth, N. H.

The Nordberg Manufacturing Company of Milwaukee, Wis., recently sustained a severe loss by fire, which destroyed patterns and machinery valued at \$25,000.

The 2400 horse-power triple-expansion Corliss engine of the Fall River Iron Works Company, at Fall River, Mass., has been started for the first time and found to work smoothly.

The Bliss Mfg. Company have been incorporated and will establish a plant for the manufacture of pumps at Bliss, N. Y.

The Chester Steel Casting Company of Chester, Pa., are building an addition to their foundry, which will be 50 x 50 feet, a new furnace house 40 x 40 feet, and a gas house 50 x 80 feet.

The Corning Iron Works of Corning, N. Y., are building a two-story addition to their plant 35 x 140 feet. The new building, which is well under way, was made necessary by increasing business.

Work has begun upon a new foundry and power house for the Stanford University, Stanford, Cal. The plans call for a structure 200 x 40 feet, divided into three apartments, 70 x 40 feet being utilized as a foundry, 40 x 100 feet as a blacksmith shop, containing 32 forges, and the remainder as a general repair shop.

The machine shops of the Louisville & Nashville Railroad at Decatur, Ala., are to be enlarged.

Last week the Leebuch Foundry & Machine Company of Pittsburgh received an order for a Mesta pickling machine, for shipment to the Falcon Iron & Nail Company, at Niles, Ohio.

Hardware.

The Boston Ferrule Company, 291 Congress street, Boston, are about erecting a series of brick buildings, to be devoted to manufacturing purposes. The first and largest one will be occupied by themselves, while the others will be rented, the company supplying the power and heat.

Champion Tool & Handle Works, Evert, Mich., announce that on account of the steadily increasing demand for the Champion lumbering tools they have enlarged their facilities, and are now fully prepared to fill all orders promptly.

The Diamond Mfg. Company of Cleveland, Ohio, have been incorporated, with a capital stock of \$10,000. The incorporators are H. J. Russ, A. E. Russ, D. F. Lillis, E. Russ and E. B. Russ. The arrangements of the company are not yet fully completed in regard to location, &c., but the intention is to manufacture Diamond portable forges and single and combined anvil and vise, adding such other articles from time to time as would naturally go to make up a blacksmith's outfit.

Ball Brothers Glass Mfg. Company, Muncie, Ind., advise us that among improvements and additions which they are making at their factory is the erection of a new office building. The interior arrangement provides for a large general office, a private office, stenographer's room and visitors' reception room. The wood work, desks and partitions are of solid oak and glass. The entire floor is of tile of neat design, the visitors' room having tile wainscoting. Each room has open fire places and handsome mantels. A large vault off from the general office provides safe storage for valuables, and the second floor is finished in one room. The company have an electric-light plant of their own.

The Chillicothe Mfg. Company, Chillicothe, Ohio, write that they are now well started in the manufacture of their specialties, coffee mills, &c., and have booked several large orders recently for these goods.

Morley Bros., Saginaw, have nearly completed the construction of a building at the corner of Telden and Germania avenues in that city for the manufacture of their line of lumber tools, cant hooks, axe handles, ox bows and ox yokes. The new works are of brick and stone, two story and basement, having a frontage on Telden avenue of 60 feet

and a depth to the Saginaw River front of 100 feet. The new plant is equipped with power hammers, blast forges and all requisite appliances for the manufacture of lumber tools; also with turning lathes and mill machinery for use in departments devoted to the making of axe handles. These works are conveniently located with reference to all railroads centering in Saginaw, and with present facilities the increased demand for this line of goods will be well cared for.

The Illinois Glue Company, Chicago, Ill., have been recently incorporated, with a capital stock of \$30,000. The company are controlled by the same parties who are interested in the Pennsylvania Glue Company, Limited, Springdale, Pa., and are virtually a branch of that concern.

Whitman Agricultural Works, Auburn, Me., are enlarging their machine shop, the contemplated dimensions being 75 x 25 feet, two stories. They are also building a warehouse 90 x 40 feet, four stories, connected with the main factory by a steel and iron bridge, 90 feet long and 9 feet wide.

Miscellaneous.

The Excelsior Brass Works of Dubuque, Iowa, are now putting in a complete plant for manufacturing brass goods of every description. The new works, which will be complete in every detail, will be ready for operation about December 1.

The Indiana Car and Foundry Works of Indianapolis, Ind., are overhauling their buildings, machinery, &c., preparatory to commencing the building of cars. Contracts have been secured and a large amount of material is now on the ground. These works were formerly operated by the Indianapolis Car Company.

A company has been organized at South Bend, Ind., to manufacture a locomotive whistle recorder, invented by B. F. Stockford of that city. The idea of the invention is to record the movement of the train and the exact time and point at which the whistle was blown.

The Illinois Pure Aluminum Company (successors to the Cincinnati Pure Aluminum Company) announce that their new factory at Lemont, Ill., will begin operations in November. They will have a fully equipped plant for the production of ingots, sheets, bars, rods, wire, castings and manufactured aluminum articles, among which cooking utensils will be prominent. The officers of the company are as follows: President, Joseph Gerharz; vice-president, Horace S. Norton; treasurer, T. J. Huston; general manager, J. C. Ashton; secretary, R. M. Shearer; superintendent, E. Doughman. A branch office is maintained in Cincinnati, room 7, Emery Arcade.

The Whitney Safety Firearms Company of Florence, Mass., will remove their plant to Scranton, Pa., providing that the Scranton Board of Trade will subscribe \$30,000 for land buildings, &c.

The Hamilton Bridge and Tool Company of Hamilton, Ont., will build a new steel pleasure steamer for the Toronto and Niagara Navigation Company. The contract calls for a side-wheeler, 311 feet long by 68 feet beam, to be driven by five boilers 21 x 11 feet in diameter, and to attain a speed of 20 miles an hour. The steamer will carry 2400 passengers and will cost \$250,000.

Clarke & Flynn's Copper and Brass Works, at Jersey City, N. J., have been burned, at a loss of \$20,000.

It is reported that the car works at Schenectady, formerly known as the Jones Car Works, will be started up again within three months. Edward C. White of New York, son of one of the original shareholders, is leading the movement, with the intention of organizing a company to build cars and other railroad stock.

The B. F. Sturtevant Company, Boston, Mass., have orders for large heating plants for Fraser & Chalmers' new works at Chicago, Ill.; Central Railroad shops at Burnside, Ill.; the Cambria Iron Company and Johnston Company at Johnstown, Pa.; Southwark Foundry and Machine Company, Philadelphia; Maryland Steel Company, Sparrow's Point, Md., and others.

Among recently authorized corporations in Illinois are the following: The Seybold Machine Company of Chicago, Ill.; capital stock, \$100,000; incorporators, Egbert C. Fuller, James B. Gascoigne and James M. Flower. The Elevating Clothes Dryer Company, Chicago; capital stock, \$100,000; incorporators, Alvard M. McLain, Joseph S. Schwab and Thomas C. Goudie. The Dillon Griswold Wire Company, Sterling; capital stock, \$200,000; incorporators, Washington M. Dillon, John G. Monahan and Moses Dillon. Laing

Machine Company, North Kankakee; capital stock, \$20,000; incorporators, John Laing, A. N. Laing, Charles T. Laing and C. D. Bacon. The Badger Furnace Company, Chicago; capital stock, \$50,000; incorporators, C. V. Smith, Henry A. Rutter and John G. Campbell. The McCosh Company, Chicago; capital stock, \$100,000; incorporators, Thompson McCosh, George C. Fry and Walter S. Maher. The Metallic Novelty Manufacturing Company, Chicago; capital stock, \$100,000; incorporators, Thomas Charlton, Freeman Lane and George W. Hered. The Acme Steel Bicycle Company, Chicago; capital stock, \$100,000; incorporators, James White, George H. Smith and Marcus A. Bigford. The Chicago Crucible Company, Chicago; capital stock, \$15,000; incorporators, Francis W. Parker, J. Elliott and M. E. Moore.

The Pioneer Armature Works, room 415, 195 to 199 South Canal street, Chicago, have established a branch of business which will prove a very great convenience to local users of electrical apparatus. They make a specialty of rewinding fields and armatures, also refill and repair commutators. The rapid advance of the use of electrical apparatus in manufacturing industries has made it necessary that repairing should be done at more convenient points than the factories in which the electrical apparatus is originally prepared.

It is stated that the Columbia, Ohio, Barbed Wire and Nail Works will remove their plant to Charleston, W. Va. Work on the buildings will be commenced at once, and the plant will be ready to begin operations February 1. Thomas Taggart is president of the company.

A 10-ton fly wheel at Merrill & Ring's saw mill, at Duluth, Minn., recently burst, sections going through the second floor, and on through the roof out into the bay.

The coke trade in the Connellsville region during the past few weeks has shown a decided improvement. Within the past month over 2000 idle ovens have been put in blast, and the production has increased from 100,000 to 125,000 tons per week. Considerable difficulty is reported by operators in securing sufficient cars to transport their product as fast as they desire. For the week ending Saturday, October 1, there were in the Connellsville region 12,739 ovens in blast, and 4514 idle, with a total estimated weekly production of 124,740 tons. Compared with the production of the previous week, this is an increase of 7156 for the week under review. The H. C. Frick Coke Company fired up 100 ovens at Standard, 100 at Stirling No. 1, 159 at Youngstown, 235 at United No. 2, and 20 at Calumet. The McClure Coke Company for the same period fired up 10 ovens at Hazlett, 26 at Mayfield, and 10 at Painter. W. J. Raney, a Cleveland operator, also put in blast 26 ovens at Grace, 184 at Paull, and 25 at Raney. This makes a total of 895 fired up during the week ending October 1. It is unlikely that any additional ovens will be put in operation during the week ending October 8, for the reason that there is a great scarcity of water supply in the region.

Consular Agent Landgraf, at Bloemfontein, Orange Free State, South Africa, reports to the State Department that the demand for foreign goods is greater than ever before. There are no manufacturing in the Republic, and although most of the trade is in the hands of English and German merchants, yet more than 50 per cent. of the imported rough goods bear American trade-marks. He thinks that direct steamship communication with the United States would increase the importations from this country and reduce the price of imported goods. He gives the following local prices of certain American articles sold in Bloemfontein: Plows, double furrow, from \$42 to \$52 each; treble furrow or more, from \$50 to \$65 each; churns (small ones), from \$5 to \$7 each; harrows, from \$12 to \$24 each; corrugated iron, from 18 to 20 cents per foot. The total imports of the Orange Free State amount yearly to \$10,000,000. The total exports, which consist chiefly of wool, mohair, ostrich feathers, hides, horns, gold and diamonds, amount yearly to \$10,050,000.

TRADE REPORT.

While there has been an increase in the capacity of the blast furnaces working from 151,648 tons weekly on September 1 to 158,027 tons per week on the 1st of this month, this has been more than offset by a decrease in the stocks during the month of not less than 82,000 tons. The increase in the output has chiefly taken place among those plants which are owned by or have close relations with rolling mills and steel plants. Foundry and Forge Irons, and particularly the former, are unquestionably firmer in all markets, but it is evident that in the West at least the attitude of sellers is to be tested by a period of dullness.

Some heavy transactions are reported in Bessemer Pig from Pittsburgh, with additional large negotiations pending. No effect has been produced on prices, which remain low.

Cleveland mills have bought about 20,000 tons of Steel Billets in the Pittsburgh and Wheeling districts, at \$23 delivered, equal to \$21.85 at mill, and other sales have been made at prices near that quoted, for winter work. The Steel works are evidently anxious to secure business for later delivery, covering their raw material at the same time. In eastern and central Pennsylvania similar influences are at work, and \$24.50 @ \$24.75 can be done for future delivery.

The eagerness to book backbone orders for the late months of this year and the early months of next year is becoming more pronounced East and West in those classes of Finished Material in which specifications need not accompany the order. Notably in the West the curious anomaly exists of a good deal of trouble in deliveries on old contracts, coupled with shading of prices to secure later work.

For Muck Bar and Skelp there is still an active demand in eastern and western Pennsylvania, and yet the signs are cropping up that there, too, concessions will be made for deliveries convenient for the mills.

Bars are weaker and irregular in all the leading markets. The Plate mills are fairly busy. Some of them are crowded, but a few, on the other hand, are skirmishing for business. Eastern Structural mills are called upon to bid for about 10,000 tons of Elevated work in Brooklyn, for delivery beginning in December, and other good orders are coming into the market, not counting the large work in sight in Philadelphia.

The buying movement in Copper has gained headway, and has been reflected in an advancing tendency, with rumors that an amicable understanding has been reached between the Haggins and other interests. Lead continues weak, and the news from the West in Spelter is by no means encouraging. Our St. Louis correspondent telegraphs sales of 2000 tons and reports the stock in the Pittsburgh, Kan., district at 3000 tons. It is reported in this market that 4.10¢ has been done in St. Louis. The demand for Tin Plate for canning has been disappointing thus far this season.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., October 11, 1892.

The general position of the market is very much the same as reported in our last. There is a considerable amount of material changing hands, and as a rule at fairly steady prices, but there is more irregularity than usually met with on a decidedly rising market. Then, again, there is a combination of circumstances which may have produced results not altogether as favorable as appears on the surface. The decrease in the supply of Pig Iron, while a good thing in itself, can hardly be regarded as a bull argument, nor can the undoubted activity in finished material be considered as an evidence that the demand has increased to any very extraordinary extent. If all the large mills were in operation, things might not look quite as brilliant, but all the same, a good deal of "hay-making is being done while the sun shines." Nevertheless, in endeavoring to define the true position of the market, it may be worth while to consider what the position would be to-day, supposing that the output of both Pig and Finished Material was the same as it was six months ago. The answer would be simply that "the market could stand it." If this theory is correct, it would seem that there is nothing in the position to warrant very strong expressions, except that prices are better, because of an important reduction in the supply. This, of course, is a good starting point for business during the next six or eight months, and so far as can be seen, the prospect in that respect is decidedly encouraging. But those who have recently been taking the cream of the business must not delude themselves into the idea that they are beyond competition. If the demand keeps up—and it probably will—furnace after furnace will start up, mill after mill will start up, until almost before it can be realized the country will again be turning out 30,000 or 40,000 tons per week more of Pig Iron, and almost unlimited quantities of Finished Material. The market is improving, however, and is likely to improve still further, and even all these vast resources may be strained to meet requirements during the coming year; but as regards the present, it should be distinctly understood that the improvement is due to decreased supply rather than to increased demand.

Pig Iron.—The market continues to harden, and it is now pretty clear that an advance of 50¢ per ton from the lowest point has been established. There is some talk of official announcements as likely to be made in certain quarters of a still further advance, but there is nothing in the situation to warrant anything of that kind, although there are elements of strength which are very encouraging to holders. Buying has been on a liberal scale lately, and if continued in the same proportion legitimately, might affect prices still further, but it is believed that consumers have engaged all the material they are likely to need during the remainder of the year, so that additional purchases would be to some extent of a speculative character, and therefore might not have any decided effect on the market, favorable or the reverse. The supply of certain grades and certain brands is beginning to run a little short, but substitutes are plenty, so that if consumers fail to get what they want in one direction, they can come very near to it elsewhere. But all the same the change in the situation is very distinct. Three or four months ago sellers were skirmishing around despairing of getting almost any kind of a bid, while to-day, the question is whether to enter a full order at a trifling advance, or to limit the quantity to

one-half, or one-third of what the buyer is willing to take. As regards the proportion between production and consumption, it is difficult to form any very definite opinion. The quantity of Iron bought during the past 30 days has undoubtedly been larger than in any similar period during the year, but prices were too low, and besides there was a large surplus to draw from. It is by no means certain that buying will continue on the same liberal scale if prices get a little higher; neither is it certain that the current output will be insufficient, backed as it has been with stocks on hand amounting to over 750,000 tons, which cannot be reduced as yet to any important extent. Considerations of this kind lead to the conviction that while slightly better prices are not improbable, it is hardly likely that any change will be made unless the demand increases beyond what is indicated by the immediate outlook. Sales continue to be made at prices about as follows for Philadelphia delivery or its equivalent, and for some Southern brands, 25¢ to 40¢ less for South and Central Pennsylvania or Maryland:

| | | | |
|--|---------|---|---------|
| American Scotch, No. 1x..... | \$17.00 | @ | \$17.50 |
| American Scotch, No. 2x..... | 16.00 | @ | 16.50 |
| Standard Penna. (Lake Ore), No. 1x..... | 15.00 | @ | 15.50 |
| Standard Penna. (Lake Ore), No. 2x..... | 14.25 | @ | 14.50 |
| Standard Penna. (Lake Ore), No. 3 plain..... | 13.50 | @ | 13.75 |
| Medium Quality, No. 1x..... | 14.25 | @ | 14.50 |
| Medium Quality, No. 2x..... | 13.50 | @ | 14.00 |
| Standard Virginia, No. 1x..... | 14.75 | @ | 15.00 |
| Standard Virginia, No. 2x..... | 14.00 | @ | 14.50 |
| Virginia and Southern, No. 1x..... | 14.25 | @ | 14.50 |
| Soft..... | 13.50 | @ | 13.75 |
| Standard Penna. and Virginia Forge..... | 13.25 | @ | 13.75 |
| Ordinary Forge..... | 12.75 | @ | 13.00 |
| Hot-Blast Charcoal..... | 17.00 | @ | 19.00 |
| Cold-Blast Charcoal..... | 33.00 | @ | 25.00 |

Bessemer and Low-Phosphorus Pig.

—There is quite a considerable inquiry and some sales, but buyers hesitate in regard to large lots, as though they were not very sure whether they wanted the Iron or not. Asking prices are \$16 @ \$16.25 at furnace for Standard Bessemer, and \$17.50 @ \$17.75 for Low Phosphorus.

Steel Rails.—No change either in price or demand. Mills are running full on other work, but have comparatively little demand for Rails. Sales at from \$30 at mills to \$31 delivered.

Steel Billets.—Prices are quoted at various figures, but there is no doubt that the right kind of orders can be placed for November, and later at \$24.75 @ \$25, Schuylkill Valley or equivalent points. For October very much higher figures are named, but there is an increasing pressure to secure business for later dates, and in some cases even the inside figure has been shaded. Probably \$24.50 @ \$26.25 would be extreme figures at both ends of the market, actual sales having been made in accordance with these figures.

Muck Bars.—There is still quite a scarcity, and lots for immediate delivery find quick sales at from \$26 to \$26.25, delivered. For November and December bids are not much over \$25.50, delivered, and, as a matter of fact, buyers are taking nothing beyond what is required for immediate use.

Skelp.—There is plenty of inquiry, and if figures could be made low enough large lots would be taken, but it is difficult to bring buyers and sellers to an agreement. Bids for Grooved are something under 1.60¢, delivered, makers asking 1.62½¢ @ 1.65¢, but likely to accept 1.60¢ for a desirable order as to quantity, sizes and date for delivery.

Bars.—There is a somewhat improved demand for Bars, and, on the whole, prices are steadier, although still somewhat irregular, according to condition of order books. There is no difficulty in placing a good sized order at 1.70¢, city

delivery, and at 1.62½¢ @ 1.65¢ at interior points, and even lower rates than these are quoted in some quarters, but the best makes are pretty well held at the figures named. The outlook is not specially encouraging, owing to the large number of mills that are seeking business, without much probability of the demand averaging more than during the earlier months of the year.

Plates.—The demand for Plates is very satisfactory, and leading mills appear to have all the business they can handle. Prices as a rule are steady, although once in awhile a low quotation is made by mills that are either running short of orders or fear they soon will be. No specially large orders have been on the market recently, but there is so much work in sight that manufacturers are not inclined to shade prices unless it may be for something that fits in conveniently with other work. General quotations, therefore, for lots delivered are about as follows:

| | Iron. | Steel. |
|------------------------|--------------|--------------|
| Blank Plates..... | 1.85 @ 1.90¢ | 1.90 @ 2.00¢ |
| Shell..... | 2.20 @ 2.30¢ | 2.20 @ 2.30¢ |
| Flange..... | 2.70 @ 2.90¢ | 2.50 @ 2.60¢ |
| Fire Box..... | 3.00 @ 4.00¢ | 2.70 @ 2.80¢ |
| Special qualities..... | | 3.25 @ 3.75¢ |

Structural Material.—Mills are full of work, and while there is no difficulty in placing orders at quoted rates, concessions are not usually available unless for something that can be handled in connection with other work. Angles are said to be irregular, and in some cases 1.85¢ at mill has been quoted, but ordinarily prices for lots delivered are about as follows: Angles or Sheared Plates, 1.95¢ @ 2¢, delivered; Universals, 2.05¢ @ 2.10¢, and Beams, Channels or Tees, 2.20¢ @ 2.30¢.

Sheets.—The demand for Sheets has been very active of late, and stocks at mills are in smaller compass than for several months past. Prices are firm, but without quotable change, sales of best makes being at prices about as follows:

| | |
|----------------------------------|---------------|
| Best Refined, Nos. 14 to 20..... | 2.75¢ @ 2.85¢ |
| Best Refined, Nos. 21 to 24..... | 2.90¢ @ 3.00¢ |
| Best Refined, Nos. 25 to 26..... | 3.15¢ @ 3.20¢ |
| Best Refined, No. 27..... | 3.30¢ @ 3.40¢ |
| Best Refined, No. 28..... | 3.40¢ @ 3.50¢ |
| Common, ¼¢ less than the above. | |

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about ¼¢ lower than are here named:

| | |
|--|-----------|
| Best Soft Steel, Nos. 14 to 20..... | 3¢ @ 3½¢ |
| Best Soft Steel, Nos. 21 to 24..... | 3½¢ @ 3¾¢ |
| Best Soft Steel, Nos. 25 to 26..... | 3¾¢ @ 3½¢ |
| Best Soft Steel, Nos. 27 to 28..... | 3½¢ @ 4¢ |
| Best Bloom Sheets, ¼¢ extra over the above prices. | |

| | |
|---------------------------------------|---------|
| Best Bloom, Galvanized, discount..... | @ 70 % |
| Common, discount..... | @ 72½ % |

Old Material.—The demand for Iron Scrap is fair, and for Steel quite active at full quoted rates. Prices are irregular however, varying according to quantity, quality, point of delivery, &c. General quotations may be given as follows: Old Iron Rails, \$19 @ \$20, delivered; Old Street Rails, \$19 @ \$20; Old Steel Rails, \$16 @ \$17; No. 1 Railroad Scrap, \$17 @ \$17.50, Philadelphia, or for deliveries at mills in the interior, \$17 @ \$18, according to distance and quality; \$11 @ \$12 for No. 2 Light; \$12 @ \$13.50 for best Machinery Scrap; \$13.50 @ \$14.50 for Wrought Turnings; \$8.50 for Cast Borings, and nominally \$20 @ \$22 for Old Fish Plates, and \$14.50 @ \$15 for Old Car Wheels.

Wrought-Iron Pipe.—There is a pretty good demand, but it is difficult to maintain prices, and extra discounts are of common occurrence. Nominal discounts are given as follows:

| | |
|-----------------------------------|------------|
| Butt, Black..... | 60 @ 10 % |
| Butt, Galvanized..... | 52½ @ 10 % |
| Lap, Black..... | 70 @ 10 % |
| Lap, Galvanized..... | 60 @ 10 % |
| Boiler Tubes, 3 inches and larger | 67½ % |
| Casing..... | 60 % |

Chicago.

(By Telegraph.)

Office of The Iron Age, 59 Dearborn street, CHICAGO, October 11, 1892.

The local market for Finished Iron and Steel is unsettled. Quotations have been made lately varying so widely that it is a difficult matter to give prices which indicate the exact condition of affairs. There is trouble in every direction over receipts on contracts, and buyers are complaining a very great deal about irregular shipments. This would seem to indicate that the rolling mills and Steel works are pressed with business and unable to supply their customers according to agreements made, but are trying to satisfy all by shipping small quantities to each one. Instead of prices maintaining themselves at the point reached the past month, there are some concerns reaching out for future business who name low prices on such trade. This has not proceeded to such an extent that general weakness prevails, but causes a raggedness which verifies the opinions of manufacturers expressed shortly after the mills started that prices would very likely recede to the old level. Meanwhile more firmness is shown in Pig Iron and Old Material, which may, in course of time, compel the manufacturers of Finished Iron and Steel to stiffen on their prices.

Pig Iron.—A great deal of business has been taken lately by furnace companies which has not been made public. Several transactions of unusually large size are coming to the surface, and the local furnace companies are in a position to command the situation and maintain quotations which they have recently been making. Consumers do not appreciate this, and hesitate to pay full prices, believing that they will still be able to obtain the concessions to which they were accustomed during the summer. This has to some extent caused a falling off in the volume of trade in local Iron during the past week. As soon as it is known that prices are on a firm basis, there is every reason to believe that buying will be resumed in full force. Not all of the large consumers have yet covered their requirements for the remainder of this year. Several are watching the market very closely now, and it may not take more than a few days for them to decide to close. Representatives of Southern furnaces have been a little more fortunate in securing business the past week than their Northern colleagues. Their customers appear to have become convinced that the higher rates asked for Southern Iron are perfectly natural, and they are taking it quite freely. Lake Superior Charcoal is in about the same condition as local Coke Iron. Inquiries are in the market for some round lots, and as soon as buyers are convinced that they cannot secure concessions contracts will be placed for such Iron also. Quotations are as follows, cash, f.o.b. Chicago:

| | |
|--------------------------------|-------------------|
| Lake Superior Charcoal..... | \$16.50 @ \$17.00 |
| Local Coke Foundry, No. 1..... | 14.50 @ 14.75 |
| Local Coke Foundry, No. 2..... | 13.50 @ 14.00 |
| Local Coke Foundry, No. 3..... | 13.25 @ 13.75 |
| Local Scotch..... | 15.00 @ 16.00 |
| Ohio Strong Softeners..... | 16.25 @ 17.00 |
| Southern Coke, No. 1..... | 14.50 @ 15.00 |
| Southern Coke, No. 2..... | 13.35 @ 13.85 |
| Southern Coke, No. 3..... | 13.00 @ 13.25 |
| Southern, No. 1, Soft..... | 13.35 @ 13.85 |
| Southern, No. 2, Soft..... | 12.85 @ 13.10 |
| Southern Gray Forge..... | 12.50 @ 13.00 |
| Southern Mottled..... | 12.50 @ 12.75 |
| Tennessee Charcoal, No. 1..... | 17.50 @ 18.00 |
| Alabama Car Wheel..... | 18.85 @ 19.85 |
| Coke Bessemer..... | 15.50 @ 16.00 |
| Hocking Valley, No. 1..... | 17.00 @ 17.50 |
| Jackson County Silvery..... | 17.00 @ 17.50 |

Bars.—Bar Iron consumers and jobbers complain that they are having a great deal of trouble in getting deliveries on contracts. Rolling mills appear to be crowded with work in every direction. Under such circumstances it is remarkable that prices should not be maintained at the level

quoted by the Valley mills. They are insisting on 1.50¢ @ 1.55¢ at mill, half extras, but competing concerns are known to be taking contracts at 1.60¢, Chicago. It was expected that before this the low sellers would have their order books filled and be out of the way, but they are still quoting and still affecting the market. A very good volume of business is in progress, and the market is in satisfactory shape so far as sales are concerned. Soft Steel Bars maintain their prices at 1.80¢ @ 1.85¢, Chicago, and some good sales have been made the past week. Jobbers quote Bar Iron at 1.85¢ @ 1.95¢, from stock and Bar Steel at 2¢ @ 2.10¢.

Structural Iron.—The great pressure for building material is now about over, but the mills seem to be well supplied with orders for some time ahead, and are not yet seeking for business with any appearance of eagerness. A very large building project is about ready to be placed, but the contractors express themselves as being inclined to wait to see whether the price of Beams will not be lower in the course of the next month or so. Other projects are coming forward, and if they all materialize there will be sufficient work to make it unnecessary for any manufacturers to give the concessions which are expected. Beams are quoted at 2.17½¢ @ 2.25¢ for round lots, and 2.25¢ @ 2.50¢ for small lots from stock. Universal Plates are selling at 2.05¢ @ 2.10¢, Chicago, and Angles at 2.05¢ @ 2.25¢.

Plates.—Quite a large business has been done since our last report. The best order taken was one for about 600 tons of Ship Plate. The demand from stock is very good and jobbers are maintaining prices at old quotations. On mill shipments Tank Steel is selling at 2.05¢ @ 2.15¢; Shell Steel, 2.20¢ @ 2.25¢, and Flange Steel, 2.35¢ @ 2.45¢, Chicago. Boiler Tubes are firm at 67½ % discount, with a stiffening tendency.

Sheets.—The starting up of the new Sheet mills in the West is helping out consumers very nicely. Good orders have been placed the past week for both Iron and Steel Sheets. Prices are in the neighborhood of 3¢, Chicago, for No. 27 Common from mill. Jobbers continue to quote from stock at 3.10¢ @ 3.20¢. Galvanized Iron is in strong demand, with the mills quoting 70 and 7½ % discount, while jobbers quote small lots from stock at 70 % for Juniata.

Merchant Steel.—Several agricultural works placed orders of considerable size the past week for their season's requirements. Other consumers are purchasing in fair quantities from time to time, and the market may be reported in good condition. Open-hearth Machinery and Tire Steel are selling at 2¢ @ 2.20¢ Chicago, in carload lots, and Spring at 2¢ @ 2.25¢. Tool Steel is in good demand at 6½¢ and upward, according to quality.

Billets and Rods.—Billets are in good demand in small quantities, and prices are firm at \$24.50. Quite a demand has sprung up recently for spot Rods, for which good prices could be obtained if they were available. The local manufacturers are well filled with orders, and continue to quote \$34.50.

Rails.—Orders are running entirely to small lots. Inquiry for next year's delivery has not yet begun. The South Chicago mill is now the only mill in this vicinity running on rails. Prices are maintained at \$31 @ \$32.50. Splice Bars are unchanged at 1.70¢ @ 1.75¢. Track Bolts, with Hexagon Nuts, 2.60¢ @ 2.70¢, and Spikes 2.10¢ @ 2.15¢.

Old Rails and Wheels.—Small sales of Old Iron Rails are reported at \$18.25. Buyers and sellers are still wide apart in their views on large lots. Old Steel Rails

continue to be quoted at \$12.50 nominally for short pieces, and \$14 @ \$14.25 for long lengths. Old Car Wheels are inactive at \$14.75 @ \$15.

Scrap.—A fair movement is occurring in nearly every grade and dealers are very much encouraged. Inquiries are more frequent and purchasers are urging prompt shipment. Quotations are as follows: No. 1 Railroad, \$16 @ \$16.50; No. 1 Forge, \$15 @ \$15.50; No. 1 Mill, \$11; Pipes and Tubes, \$10; Horseshoes, \$16 @ \$16.50; Sheet Iron, &c., \$6; Cast Borings, \$5.75; Wrought Turnings, \$8; Axle Turnings, \$9.50 @ \$10; Machinery Cast, \$11.50 @ \$12; Stove Plate, \$9; Malleable Cast, \$10; Car Axles, \$18.50 @ \$19; Fish Plates, \$17.25; Mixed Steel, gross ton, \$10.50 @ \$11; Coil Steel, \$15; Leaf, \$16.50, and Tires, \$15.

Metals.—The Copper market is very strong and the producers have instructed agents not to press sales, indicating that they expect higher market. Carload lots of Lake sold on Saturday at 12¢, and less than carload lots at 12.25¢. Casting brands in carload lots have sold up to 10.85¢. Spelter is again in good demand, the bear movement having proved ineffective in reducing prices. Prime brands are quoted at 4.40¢, in carload lots. Pig Lead declined still further the past week, and sales of about 500 tons were made at 3.82½¢ @ 85¢. At the close quotations ranged from 80¢ @ 85¢, and consumers are beginning to show more interest in the metals.

Pittsburgh.

Office of The Iron Age, Hamilton Building, }
PITTSBURGH, October 11, 1892. }

As we approach the close of the year, the disposition among producers of both Raw and Finished Material to book business for delivery extending into next year is becoming more pronounced. In order to accomplish this, prices are being made attractive, and this would indicate that makers have very little, if any, faith in better prices prevailing during the first few months of 1893 than are ruling now. In fact, the one object of makers just now seems to be to have their order books filled with enough business to insure steady operations during the winter months. For prompt deliveries prices on both Raw and Finished Material are being fairly sustained, and show quite a substantial advance over prices that are being accepted for delivery three or four months hence. In Pittsburgh the Iron and Steel mills are all busy and turning out an enormous amount of material. The same conditions are ruling in the Mahoning and Shenango valleys and also in the Wheeling district. Pig Iron is in good, steady demand, but prices do not show any inclination to advance. On the contrary, the supply will be visibly increased in the near future by the starting up of a number of stacks in the Pittsburgh, Mahoning and Shenango valley districts that have been idle for some months. This, of course, will have its influence against any advance in prices on account of increasing very materially the supply of Pig Iron. At this time Pittsburgh is comparatively free from labor troubles. The struggle at the Elba Iron Works of the Oil Well Supply Company is the only one that is going on, and this will soon be a thing of the past, as the number of workmen is being increased very fast, and in a short time the plant will be on full in all departments. In all probability the trials of the Homestead strikers on the various charges of murder, treason, conspiracy and riot will be taken up by the local courts within the next three or four weeks, and the proceedings and outcome of the trials are being awaited with intense interest by

both employers and workmen. It is expected that at these trials it will be shown how far employees can go in their efforts to force their employers into a compliance with their demands, and at the same time keep within the bounds of the law. If the charges that have been made against the officials of the Carnegie Steel Company, Limited, are pushed to trial, and the wish is expressed everywhere that they will be, it will also be shown what steps may legally be taken by employers to protect their interests when involved in a labor conflict with their employees.

Pig Iron.—The extraordinary activity prevailing in the Soft Steel market is beginning to have its effect on Bessemer Pig, and some large transactions took place last week, and others are pending that will probably be closed before this week is out. As is the case with Finished material, furnace operators are showing a disposition to book enough orders to tide them over the winter months, and as a result some transactions are now being made with deliveries running as late as March of next year. We can report a very fair demand for Gray Forge, and the open price of \$12.50, f.o.b. cars at buyers' mill is well sustained. A moderate demand is going for Foundry Iron, and \$14 for No. 1, and \$13 for No. 2, fairly represents the market for these brands, although reports of sales of No. 1 at \$13.75 and No. 2 at \$12.75 are going. In the Pittsburgh district out of a total of 26 stacks, 21 were active on October 1, and five were idle. Of the 21 active stacks 19 were running on Foundry and Bessemer, the product for September being 122,942 tons of 2240 pounds. Two stacks of the Carnegie Steel Company, Limited, were on Spiegel, the output for September being 5495 tons of 2240 pounds. The five idle stacks are Edith of the Oliver Iron & Steel Company, two stacks of the Isabella Furnace Company, one stack of Schoenberger & Co. and Soho of the Moorhead McCleane Company. Of these Edith will blow out about October 15, and the two Isabella stacks will start up during this month. While we quote Bessemer Iron as low as \$13.65, we desire to state that the open market is \$13.70 and \$13.75, and in a few cases \$13.85 is obtained. We quote the market as follows:

| | |
|-----------------------------|--------------------------|
| Neutral Gray Forge..... | \$12.50 @ \$12.75, cash. |
| All-Ore Mill..... | 12.50 @ 12.75, " |
| No. 1 Foundry..... | 14.00 @ 14.25, " |
| No. 2 Foundry..... | 13.00 @ 13.25, " |
| Charcoal Foundry No. 1..... | 19.50 @ 20.00, " |
| Charcoal Foundry No. 2..... | 19.00 @ 19.50, " |
| Bessemer Iron..... | 13.65 @ 13.80, " |

We note a sale of 6000 tons of Bessemer, equal shipments in November and December, at a price based on \$13 at Mahoning Valley furnace. This Iron does not come to Pittsburgh, and the sale has some conditions attached which will partly account for the very low price at which the sale was made. We also note a sale of 2000 tons of Bessemer for October delivery at \$13.75, f.o.b. at buyer's mill, and sales aggregating about 6500 tons for November and December delivery at \$13.70, at buyer's mill; also a sale of 2000 tons of Gray Forge for October delivery at \$12.50, delivered at buyer's mill. A deal involving about 15,000 tons of Bessemer is pending, and will probably be closed during this week.

Bessemer Billets.—The puzzling conditions surrounding the Billet market referred to in our report of last week continue, and are becoming more marked. With the majority of Steel mills well fixed for business, and every assurance of an enormous consumption for some time to come, prices are giving way, and unless something occurs to brace the market there is every indication of still lower values in the near future. The one explanation offered for these unusual conditions, is that a few mills desire to book enough

orders to take their output for the winter months, and to do this are securing orders by naming very favorable prices. The event of the week was several sales of Billets aggregating from 16,000 to 20,000 tons at a price said to be \$23 f.o.b. cars at Cleveland, the deliveries being December, January, February and March. Pittsburgh is credited with taking about 12,000 tons of the business, and as the rate from Pittsburgh to Cleveland is \$1.15 per ton, it means \$21.85 on cars at maker's mill, Pittsburgh. In addition we note a sale of 3000 tons for balance of the year delivery, at a price equal to \$21.95 at maker's mill, and also a sale of 3500 tons at a price equal to \$22.05 at maker's mill, Pittsburgh. In sympathy with Billets for late delivery, prompt Billets have weakened to some extent, and are now quoted at \$22.50 @ \$23. We note a sale of 1000 tons at \$22.50, for October delivery, and 1200 tons at \$22.65, for same delivery, both prices being f.o.b. cars at maker's mill.

Structural Material.—We continue to report a very heavy demand for Structural Shapes of all kinds, especially for prompt delivery, and owing to the fact that the mills here were out of the market so long and are not yet in position to turn out as large an output as before the labor troubles commenced, there is considerable difficulty in getting material as promptly as it is wanted. During the past week a purchase of Beams was made in this city for which 2.10¢ was paid, and, in some recent sales considerably higher than this figure was paid in order to get early shipments. The labor troubles at the Upper and Lower mills of the Carnegie Steel Company, Limited, are a thing of the past, as the output at both these plants is as large now as at any time before in their history. We have advanced prices on Beams and Channels and now quote the market as follows: Beams and Channels, 2.05¢ @ 2.10¢ for desirable orders, and 2.15¢ @ 2.20¢ for small lots; Universal Mill Plates, Steel, 1.75¢ @ 1.80¢; Angles, 1.85¢ @ 1.95¢; Tees 2.40¢ @ 2.50¢, and Z Bars 2¢ @ 2.10¢.

Ferromanganese.—A fair demand is going and the recent advance in prices seems to be well sustained. We quote 80% Ferro at \$62 @ \$62.50, delivered at buyer's mill, and note a sale of 250 tons for November delivery at the first named price.

Muck Bars.—An active demand is going, and prices for prompt shipment of Muck Bars continue firm at \$24.50 @ \$25, delivered at buyer's mill. The output of Muck Bars in this city has been very materially increased during the last month or so, and prompt shipments are obtained with less trouble than was experienced some weeks since. We note a sale of 700 tons of No. 1 Bars at \$24.75 for October and November delivery.

Steel Rails.—There is nothing new to report, and it has been some weeks since an order involving any very large amount has been booked in this city. A fair run of small orders is going, but taken as a whole the situation, as far as new business is concerned, could hardly be worse. Prices are unchanged, being \$30 for standard sections f.o.b. at mill.

Skelp Iron.—An active demand is reported, but with the large production now going on prompt shipments are much more easily obtained than they were some time since. We are advised that two or three mills in this city have enough business booked to keep them fully employed for the balance of the year. Prices do not show much change, although where deliveries are not wanted for some time prices quoted below are shaded to some extent. We quote the market for Skelp Iron for shipment within 30 days from date of order at 1.60¢ @ 1.70¢ for Grooved, ac-

ording to sizes, and 1.80¢ @ 1.90¢ for Sheared, four months, 2 % off for cash.

Steel Plates.—There seems to be no diminishing in the demand for this class of material, and mills in this city have not been as well fixed for business for some time as they are at present. As we have before stated, however, competition is keen, and as a result buyers are quick to take advantage of the situation, and in many cases succeed in having their orders booked at very low prices. As in the case with other material, the time of delivery plays an important part in the transaction, and where prompt shipments are wanted better prices are obtained than would be accepted for shipments late in the year or early next year. Prices continue as noted in our report of last week as follows: Flange, 2¢ @ 2.25¢, according to the time of delivery; Fire Box, 3.50¢ @ 3.75¢; Tank, 1.75¢ @ 2¢; Shell, 2¢ @ 2.25¢; Bridge Plates, 2¢ @ 2.15¢.

Wire Rods.—The activity prevailing for some time among Wire-Nail mills has very materially increased the demand for Rods and, as a consequence, prices are firmer and tending upward. Pittsburgh makers of Wire Rods are well supplied with business, and are not inclined to make new contracts unless they secure a considerable advance in prices ruling a month ago. We quote the market for Wire Rods at \$31.50, although some makers state that they will not book any additional orders at less than \$32. We note a sale of 200 tons for October delivery at \$31.25, f.o.b. at maker's mill.

Merchant Steel.—As far as demand is concerned business is in very satisfactory condition, and mills generally have plenty of orders. The season when agricultural implement manufacturers place their orders is now at hand, and large contracts for agricultural Steel will probably be placed within the next 30 or 60 days. Customers continue to complain about the failure of certain mills to ship orders when promised, and the charge is made that deliveries are promised when it is known absolutely at the time time that they cannot be made. We repeat our quotations of last week as follows: Open-Hearth Spring, 2¢ @ 2.25¢; Tire, 2¢ @ 2.15¢, and Toe Calk, 2.25¢ @ 2.40¢; Tool Steel continues to rule at 6¢ and upward, according to quality.

Barb Wire.—As noted in our report of last week, the very low prices ruling for some time have stimulated the demand considerably and a very large amount of business has been booked within the past month. Mills in the Pittsburgh district are pretty well sold up for some time, and in one or two cases are refusing to book any more orders at present low prices. We quote: Painted Barb Wire at \$2.05 @ \$2.10, in carload lots, and Galvanized at \$2.40 @ \$2.50, in similar quantities. If the present active demand continues a slight advance in prices is not improbable.

Bars.—Although the season is getting late the heavy demand going for the past two months continues. A number of our local mills have their entire output for the balance of the year disposed of, and are entering orders for delivery early in 1893. There continues to be quite a difference in prices obtained for prompt shipments and those obtained for shipments late this year or early next year. No. 1 Bars for October shipment may be fairly quoted at 1.70¢ @ 1.75¢ for shipment during November and December, and early next year 1.60¢ @ 1.65¢ is obtained. Old Rail and Scrap Bars for October shipment are bringing about 1.60¢, and for later shipment about 1.50¢. The demand for Sheets continues very large, and it is almost impossible for buyers to get prompt shipments. We quote No. 24 Sheets at 2.75¢, No. 26 at 2.85¢, No. 27 2.95¢, all for prompt ship-

ment. For later shipments these prices would no doubt be shaded 10¢ or 15¢.

Wire and Cut Nails.—The conditions existing in the trade as noted in our report of last week continue, and Wire Nails for October shipment are very scarce. Mills for some time past have been booking orders for shipment this month, and as a result are crowded to their utmost capacity in order to fill them. Notwithstanding the very active demand prices continue weak, and Wire Nails for October shipment may be quoted at \$1.55 in carload lots. For shipment in November and later we quote at \$1.50 in carload lots. It is stated that the last-named price has been slightly shaded recently where large blocks were involved. There is nothing new to report in the Cut-Nail trade, and the same conditions noted in our report of last week prevail at this time. Cut Nails for October shipment we quote at \$1.50 @ \$1.55 for 30¢ averages. For shipment after November 1 prices may be fairly quoted at \$1.45 @ \$1.50 in carload lots.

Scrap Iron and Steel.—A very slight improvement in demand is noted, although not sufficient to cause any advance in prices. Scrap dealers here report that the Eastern markets for Scrap material are in very much better shape than they are in Pittsburgh, and as a consequence considerable Scrap is being shipped from this section to Eastern points. It is claimed that it pays to do this, the higher prices obtained more than offsetting the increased cost of transportation. Prices do not show much change, and we quote as follows: No. 1 Railroad Wrought Scrap, \$14 @ \$14.50 @ net ton; Cast Scrap, \$11.50 @ \$12 @ gross ton; Billet and Bloom Ends, \$16 @ ton; Cast-Iron Borings, \$6.50 @ \$7 @ gross ton; Railroad Coil Springs, \$17.50 @ \$18 @ gross ton; Leaf Springs, \$19.50 @ \$20; Old Steel Axles, \$19 @ gross ton.

Wrought-Iron Pipe.—There is nothing new to report, and the same conditions prevail in this branch of business as have been noted for several weeks past. Discounts are unchanged, but continue to be shaded liberally where large orders are involved.

Cleveland.

CLEVELAND, OHIO, October 10, 1892.

Iron Ore.—Considerable buying is being done at prices from 50¢ @ 65¢ per ton below the quotations for the same grades of Ore last year. Some non-Bessemer Ore has been sold during the week at figures close to \$3 @ ton, lower lake delivery, while good Bessemer Iron, as low as 5 % in phosphorus, is selling at about \$4. No really large sales are reported for the past week, although the volume of business transacted is larger than for several weeks past. About 60,000 tons of Ore were unloaded at Cleveland during the past week, while the receipts at all Lake Erie ports for the same period aggregated 150,000 tons. About 30,000 tons of Ore were sent forward to the furnaces during the same length of time. Estimates of the aggregate receipts of Ore from the Lake Superior district for 1892 vary from 7,750,000 to 8,500,000 tons, with the probabilities in favor of the latter figures being nearest correct. Transportation rates are unchanged, the shippers by persistent effort having kept the figures down to 75¢ from Escanaba, \$1.10 from Marquette and \$1.20 from Ashland and Two Harbors. Dealers are unable to say when the heavy buying movement will be resumed. A large amount of Ore will undoubtedly be sold before the close of navigation, but just what circumstances are to precipitate the purchases are not easy to determine. The season seems likely to close with an unusually large quantity of unsold Ore upon

the docks, unless some of the negotiations now pending should be closed at an early date.

Pig Iron.—The market shows some signs of improvement. The demand is somewhat better and prices seem a little firmer. A few scattering sales of Bessemer and Gray Forge Irons are reported and quite a number of inquiries are being received, although the market cannot be called really active. However, the volume of business is larger than for several weeks past and consumers not already supplied with Iron for the balance of the season are looked to for some substantial orders before the holidays. Dealers quote as follows:

| | |
|------------------------------------|-------------------|
| Nos. 1 to 6 Lake Superior Charcoal | \$16.50 @ \$17.00 |
| Nos. 1, 2 and 3 Bessemer, per ton. | 14.00 @ 14.25 |
| No. 1 Strong Foundry, per ton. | 14.25 @ 14.50 |
| No. 2 Strong Foundry, per ton. | 13.25 @ 13.50 |
| No. 1 American Scotch, per ton. | 14.50 @ 14.75 |
| No. 2 American Scotch, per ton. | 13.75 @ 14.10 |
| No. 1 Soft Silvery, per ton. | 15.00 @ 15.50 |
| Mahoning and Shenango Valley | |
| Neutral Mill Irons, per ton. | 13.00 @ 13.25 |
| Mahoning and Shenango Valley | |
| Red Short Mills, per ton. | 13.25 @ 13.50 |

Old Rails.—Although the market is somewhat improved, prices do not advance and sales are still reported at \$19 @ \$19.50 per ton. Indeed, local buyers say that no difficulty is experienced in procuring old American in any desired quantities at \$19 per ton.

Nails.—The market is fairly active, although prices are not very firm. There is a brisk demand for Wire Nails at \$1.65 @ \$1.70 per keg, while Steel Cut Nails are quoted at \$1.60 @ \$1.65 per keg in stock.

Scrap.—There is an improvement in the demand, but stock piles are so large that little is to be expected in the way of an advance in prices. No. 1 Railroad Wrought is quoted at \$16 @ \$16.50; Cast Scrap at \$12 @ \$12.50, and Wrought Turnings at \$8 @ \$8.50.

St. Louis.

Office of The Iron Age,
Bank of Commerce Building,
ST. LOUIS, October 10, 1892.

Pig Iron.—The past week was not remarkable for any particular activity, and prices remain practically unchanged. Sales were limited to ordinary quantities for prompt shipment at current quotations. Consumers are unwilling to pay the advance which furnaces ask and seem disposed to defer their purchases until actual requirements compel them to enter the market as buyers. Some few sale have been made at the advance, but there still remains some low-priced Iron on the market which continues to make its appearance from time to time. Stocks continue to grow less on the furnace banks, and with any kind of a fair trade a higher market will doubtless prevail. On the other hand, however, there are a number of furnaces which have been idle for some time, but are now getting in shape to "blow in." To offset this, an increased demand will have to make its appearance, else the present quotations will not prevail long, but will give way to a lower range of prices. The chances are favorable, however, for an increased demand and a gradual advance in prices. The outlook is encouraging, and as the improvement noted last week continues furnacemen are not disposed to accept business at less than prices quoted herewith, which are for cash, f.o.b. cars St. Louis:

| | |
|-------------------------------|-------------------|
| Southern Coke, No. 1 Foundry, | \$13.75 @ \$14.00 |
| Southern Coke, No. 2 Foundry, | 12.75 @ 13.00 |
| Southern Coke, No. 3 Foundry, | 12.25 @ 12.50 |
| Gray Forge | 11.75 @ 12.00 |
| Southern Charcoal, No. 1 | |
| Foundry | 15.25 @ 15.75 |
| Southern Charcoal, No. 2 | |
| Foundry | 14.75 @ 15.00 |
| Missouri Charcoal, No. 1 | |
| Foundry | 14.25 @ 14.50 |
| Missouri Charcoal, No. 2 | |
| Foundry | 13.75 @ 14.25 |
| Ohio Softeners | 16.25 @ 16.75 |

Bar Iron.—A steady trade is reported in this department at unchanged prices. The outlook for a continuance of activity for the balance of the year is considered encouraging, and as some mills are already sold up to November 1, it is easily seen why prices are so well maintained. We quote as follows: Lots from mill, 1.65¢, half rates, f.o.b. cars East St. Louis. Jobbers quote 1.80¢ @ 1.85¢, according to quantity.

Barb Wire.—The demand for Barb Wire shows a continued falling off, and prices fail to improve. The fall trade is not so large as was anticipated, and the conditions at present existing indicate a lower range of prices. Mills quote \$2.20 for Painted, and \$2.65 for Galvanized, which prices are shaded according to the size of the order.

Wire Nails.—There is no improvement to note either as regards demand or price of Wire Nails. The country trade report a dull market, and there does not seem to be much chance of any improvement. Jobbers are looking for lower prices before placing their orders, and are not likely to be disappointed. Local mills quote \$1.65 @ \$1.70, f.o.b. St. Louis, and do not seem disposed to accept less than these prices, although we hear of sales at less figures.

(By Telegraph.)

Pig Lead.—The market is weak and unsettled and offerings are made at 3.70¢, at which price some good-sized sales are reported for delivery during the balance of the year. The outlook for any improvement, so far as prices are concerned, is not encouraging.

Spelter.—The situation in Spelter is decidedly mixed. During the past week sales of upward of 2000 tons have been booked at 4.12½¢, and offerings are freely made for delivery during the next six months at 4.15¢ without much business resulting. The condition of the Galvanized Iron and Barb Wire industries, which are large consumers of Spelter, has something to do with the decline in price, but the principal cause is seen in the large stocks in the hands of smelters, which are unusually heavy. To our knowledge there is in the Pittsburgh, Kan., district something over 3000 tons on hand. Conservative judges of the market predict 3.75¢, while others say that 3.50¢ will be reached before any improvement will be recorded.

Hickman, Williams & Co., Louisville, Ky., successors to Hickman, Cousen & Co., have been appointed agents for Kentucky and Indiana for the Sloss Iron & Steel Company's Pig Iron.

Louisville.

LOUISVILLE, KY., October 10, 1892.

While there has been no further advance and buying only in small lots, there is a degree of firmness in the Pig Iron market that is encouraging to both consumers and producers. Manufacturers are running full capacity, and are beginning to urge shipments forward a little in excess of their contracts; this is in marked contrast to the situation a short while back. Furnaces are not disposed to meet the views of buyers in their desire to make purchases for deliveries running nearly through 1893, and so far no contracts of any magnitude have been made for delivery ex-

tending beyond the first three months of the year. We quote for cash, f.o.b. cars Louisville:

| | |
|----------------------------------|-------------------|
| Southern Coke, No. 1 Foundry | \$13.25 @ \$13.75 |
| Southern Coke, No. 2 Foundry | 12.25 @ 12.75 |
| Southern Coke, No. 3 Foundry | 11.50 @ 11.75 |
| Southern Coke, Gray Forge | 11.00 @ 11.50 |
| Southern Charcoal, No. 1 Foundry | 15.00 @ 16.00 |
| Southern Car Wheel | 17.50 @ 19.00 |

New York.

Office of The Iron Age, 96-102 Reade street, }
NEW YORK, October 11, 1892. }

Pig Iron.—Sellers report only a moderate volume of business. From the South comes the report that an offer has been made to one of the leading companies in the Birmingham district for an exceptionally large lot of Pig Iron from a speculative source. We quote Northern brands at \$15 @ \$15.50 for No. 1; \$14 @ \$14.50 for No. 2; \$13 @ \$13.50 for Gray Forge, tidewater. Southern Iron, same delivery, \$14.50 @ \$15 for No. 1; \$13.50 @ \$14 for No. 2 and No. 1 Soft; \$13 @ \$13.50 for No. 2 Soft; \$12.50 @ \$13 for Gray Forge.

Ferromanganese.—The market for foreign is dull at \$60 @ \$60.50 for foreign 80 %.

Billets and Rods.—No business of any consequence is reported in foreign or domestic Billets and Rods, which we quote: \$40.50 @ \$41 for foreign Rods, \$33.50 @ \$33.75 for domestic Rods, \$54.50 @ \$56 for Swedish Rods and \$30 @ \$30.50 for foreign Billets.

Steel Rails.—The market continues lifeless. Only small quantities are asked for, and thus far very little fall and winter work has come up. It seems that the Western mills are not in a much better condition, so far as future orders are concerned, than the Eastern works. There is very little new construction going on, and but little coming out, so that the mills seem limited to what renewal work the trunk lines will give them for the winter months, in anticipation of heavy traffic next spring and summer. Standard sections are \$30 at Eastern mill. Light sections are \$36.10 for 20 lb, \$34.60 for 25 lb, \$33.60 for 30 lb, \$33.10 for 35 lb, and \$30.10 for 40, 45 and 46 lb sections, November delivery.

Manufactured Iron and Steel.—A good deal of interest attaches to the forthcoming bids on 10,000 tons of Structural work for the Brooklyn Elevated road, this class of work generally being taken at very close figures. A lot of 2500 tons for the New York Central will also come into the market at an early date, and there is some talk of large buildings. We quote Beams, 2.35¢ @ 2.75¢ for small lots and 2.20¢ @ 2.50¢ for round lots, according to sizes; Angles, 1.95¢ @ 2¢; Sheared Plates, 1.85¢ @ 2.10¢; Tees, 2.30¢ @ 2.75¢; Channels, 2.25¢ @ 2.50¢, on dock. Car Truck Channels, 2¢ @ 2.10¢. Steel Plates are 1.9¢ @ 2¢ for Tank; 2.20¢ @ 2.25¢ for Shell; 2.50¢ @ 2.65¢ for Flange; 2.6¢ @ 2.75¢ for Marine, and 3¢ @ 3.25¢ for Fire Box, on dock. Refined Bars are 1.67½¢ @ 1.9¢, on dock; Common, 1.55¢ @ 1.60¢. Scrap Axles are quotable at 1.95¢ @ 2.10¢, delivered. Steel Axles, 1.95¢ @ 2.1¢, and Links and Pins, 2¢ @ 2.20¢; Steel Hoops, 1.90¢ @ 2¢, delivered. Cotton Ties, 85¢ @ 90¢, at mill.

Merchant Steel.—We quote Machinery, 1.80¢ @ 1.85¢; Tire, 1.85¢ @ 2¢; Toe Calk, 2.20¢ @ 2.30¢, and Sleigh Shoe, 1.75¢ @ 1.80¢, delivered.

Track Material.—We quote Spikes, 1.90¢ @ 2¢; Fish Plates, 1.60¢ @ 1.65¢; Track Bolts, square nuts, 2.40¢ @ 2.60¢, and hexagon nuts, 2.70¢ @ 2.90¢, delivered.

Metal Market.

Copper.—The livelier buying movement that started in during the period covered by our last review has made further headway, and, with the improvement in that particular, there is to record a further hardening of values. Just how extensive the transactions have been is not made clear, but the few particulars divulged go to show that the business is in excess of that of any preceding week for several months, although including deliveries very little if at all beyond the end of this year, and that consumers manifest a livelier interest as requirements become more urgent. The transactions in Lake Superior Ingot have been at from 11½¢ up to 11.00¢, as to size of lot and delivery, and at the close 11½¢ upward was quoted. Electrolytic is held at within about ¼¢ of the going price for Lake, and on common casting brands 10½¢ @ 10¼¢ is quoted. Rumor has it that an amicable understanding has been arrived at between the Haggin interest and others as to future production, but confirmation is lacking at headquarters.

According to the monthly report of the Bureau of Statistics the importations of Ores into the United States during the eight months ending August 31, 1892, were equivalent to 4,498,166 lb of fine Copper, against 7,906,627 lb in the corresponding period last year. Importations of Pigs, Bars, Ingots, &c., amounted to 1,055,210 lb and 2,493,419 lb respectively.

The bureau report also affords the following comparison of exports from the United States:

| Ore and Matte. | | | | |
|----------------------|-----------|-------|--------------|--------|
| To | —August.— | | —Eight mos.— | |
| | 1892. | 1891. | 1892. | 1891. |
| | Tons. | Tons. | Tons. | Tons. |
| United Kingdom | 3,082 | 2,277 | 34,600 | 27,878 |
| Germany | 485 | 1,462 | 1,859 | |
| Other Europe | | 165 | 216 | |
| Totals | 3,082 | 2,762 | 36,227 | 29,953 |

| Ingot. | | | | |
|----------------------|-----------|------------|--------------|---------|
| To | —August.— | | —Eight mos.— | |
| | 1892. | 1891. | 1892. | 1891. |
| | Pounds. | Pounds. | Pounds. | Pounds. |
| United Kingdom | 224,197 | 2,806,118 | | |
| Germany | 201,021 | 1,114,630 | | |
| France | 642,650 | 4,908,697 | | |
| Other Europe | 494,906 | 1,614,884 | | |
| Elsewhere | | 26,377 | | |
| Totals | 1,562,864 | 10,470,706 | | |

| To | —August.— | | —Eight months.— | |
|----------------------|------------|------------|-----------------|---------|
| | 1892. | 1891. | 1892. | 1891. |
| | Pounds. | Pounds. | Pounds. | Pounds. |
| United Kingdom | 2,218,712 | 12,739,598 | | |
| Germany | 4,913,336 | 4,186,796 | | |
| France | 5,629,077 | 19,144,544 | | |
| Other Europe | 7,901,875 | 13,959,349 | | |
| Elsewhere | 94,013 | 164,728 | | |
| Totals | 20,657,013 | 50,195,017 | | |

Pig Tin.—In a speculative way business has been done to the extent of several hundred tons at 20¼¢ @ 20½¢, net cash, for October and November delivery. The transactions were without the slightest sign of any disposition to venture on the part of other operators than those who have been most conspicuous in the market for some time past, and the situation is devoid of distinctly new features. With the upward movement in prices, consumers, as usual, manifested rather livelier interest at times, but supplies were found to be forthcoming at prices remarkably close to those at which speculative deals were recorded, and surface indications are that upward movements in London quotations are made the most of to cut down the heavy supplies that are being carried in this market. Undoubtedly there is enough Tin to go around and more support to values given by the speculative element than by the relation of supply and consumptive demand.

Pig Lead.—There have been additional sales of a few hundred tons of Common

Domestic at 4¢, and there seems to be more to be had at that price. In other words, the market continues weak and unsettled, with surface indications that, while fairly liberal, the consumption is not in line with the production. Speculative interest is practically dead for the time being, leaving the future of the market practically dependent upon the endurance of producers and consumers.

Spelter.—Western brands have been freely offered and the market continues in a depressed condition, with no evidence of inclination on the part of the galvanizers or Brass manufacturers to purchase in anticipation of future wants to any great extent, despite present very low cost. Single carloads of prime brands have been sold at 4.45¢, larger quantities at 4.40¢, and at the close there were offerings at the latter price.

Antimony.—The movement of ordinary sized lots has been fair, and prices remain quite steady at about 10½¢ @ 10¼¢ for Hallet's, 11¢ for LX, 11½¢ for Crown and 11½¢ @ 11¼¢ for Cookson's in round lots.

Tin Plate.—Can makers complain that the usual September-October demand has been disappointing, owing to short crop of various lines of vegetables and fruit, and that prices have fallen instead of advancing, as they usually do at this season of the year. Hence the demand from that quarter is slow and disappointing. From other sources there has been a fair sort of inquiry, but purchases are chiefly of homeopathic character, and prices have little support other than that due to moderate supply of particular grades and sizes in first hands. We quote as follows: Coke Tins—Penlan grade, IC, 14 x 20, \$5.20; J. B. grade, do., \$5.37½; Bessemer do., \$5.25 for full weight; \$5.15 for 100 lb, \$5.05 for 95-lb, \$4.80 for 90-lb Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60 @ \$5.65; Siemens Steel, IC basis, \$5.75; IX basis, \$6.80 @ \$6.85. IC Charcoals—Melyn grade, ½ X assortment, \$6.40; Crosses, \$8; Allaway grade, ½ X assortment, \$5.70; Crosses, \$7.20; Grange grade, ½ X assortment, \$5.80; Crosses, \$7.25. Charcoal Terns—Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11.40; M. F., 14 x 20, \$7.90; do., 20 x 28, \$16; Dean, 14 x 20, \$5.45; do., 20 x 28, \$10.80; D. R. D. grade, 14 x 20, \$5.35; do., 20 x 28, \$10.65; Alyn, 14 x 20, \$5.40; do., 20 x 28, \$10.70; Dyffryn, 14 x 20, \$5.65; do., 20 x 28, \$11.10. Wasters—S. T. P. grade, 14 x 20, \$5.10; do., 20 x 28, \$10; Abercane grade, 14 x 20, \$5; do., 20 x 28, \$9.80.

Matthiessen & Hegeler Zinc Company of La Salle, Ill., announce a special discount of 4%, a 3% for cash with order, and a 3% quantity discount, on first class, 15,600 lb casks and upward.

Financial.

The Columbus festivities this week absorb public attention, to the exclusion of all but the most important business. Although the mercantile exchanges are open, the volume of transactions is of small proportion. A difference of opinion has arisen relative to the payment of commercial paper falling due on October 12 and October 21. The counsel for the Clearing House, J. R. Dyett, has given an opinion on the matter, by which the banks will stand. The Clearing House will be closed on the days named. In the several trades the week has been uneventful, aside from a spurt in cotton, which sold to the extent of 1,500,000 bales, a larger weekly total than within several months, outsiders thinking apparently that cotton at present prices is cheap. Operations in grain were

characterized by more vigor, particularly wheat, which was decidedly stronger. The buoyancy was attributed partly to the better tenor of cable advices and partly to the protracted drought. Another strengthening factor was the improved demand on spot for export. Provisions were quiet. The Cincinnati Price Current says: "The week's export clearances of hog products were unusually large in both lard and meats, gaining 50 per cent. over corresponding period last year. The indications now are that, for the year ending October 31, the exports of meats will reach 700,000,000 lb. Exports of lard the past year have been equaled previously in but one instance."

Referring to the recent unexpected large demand for wheat from the Continent the Liverpool Corn Trade News is expecting a repetition of last year's experience, and thinks it will be prudent to reckon on the probability of full average requirements by all the bread-eating nations. During 1892-93 coffee has shown much strength. Sugar steady, except that prices for refined are slightly lowered. Dry goods jobbers report a quiet market preceding the holidays. It was reported from Philadelphia on Monday that the Pennsylvania Railroad had advanced tolls to correspond with the Reading, so that harmony in the coal trade is supposed to have returned.

The week's bank clearings show an increase at almost all points, the aggregate being nearly 6 per cent. more than for the corresponding week last year. For nine months bank clearings at 61 cities in the United States show an increase of almost 10 per cent. as compared with the like total for 1891. Chicago clearings have at last exceeded Boston's total, giving the former second place in the list. Out of the 61 cities reporting for nine months this year and last, only 11 show decreases. In New York for the year ending October 1 the bank clearances reveal a rapid increase of business. On September 28 an event took place unprecedented in the history of the Clearing House. The transactions of a single bank on that day amounted to \$2,240,000, and that large sum was actually cleared by the payment to the bank of only 76 cents. This is a signal illustration of the clearing system.

The stock market, after showing more animation, yielded to realizing sales and bearish pressure which continued to the close of the week, with occasional reactions. One feature was a rapid rise in General Electric on news of a decision by the United States Court of Appeals affirming the decree of Judge Wallace in favor of Mr. Edison as the patentee of the incandescent lamp. Another feature was an advance in National Cordage on the declaration of increased dividends. The selling of New England and Reading was encouraged by reports that there is really no important deal in contemplation, and that there will simply be a traffic agreement between the New England, the Reading and the Boston and Maine. The indisposition to trade was attributed to the approaching holidays.

United States bonds were quoted as follows:

| | |
|----------------------------------|------|
| U. S. 4½s, 1891, extended | 100½ |
| U. S. 4s, 1907, registered | 114 |
| U. S. 4s, 1907, coupon | 11 |
| U. S. currency 6s. | 107 |

The money market has worked a little closer, call loans running up one day as high as 10 per cent., advantage being taken of an opportunity. Time contracts on good collateral were 4 per cent. bid for 60 to 90 days, and 5 for 4 to 6 months. There was a fair demand for commercial paper, and a few of the city banks were in the market. Quotations were 4½ to 4¼ per cent. for 60 to 90-day indorsed bills receivable, 5 to 5½ for four months' acceptances. The bank statement showed a loss of \$3,-

500,600 in cash and of \$2,455,825 in surplus reserve, leaving this item at \$1,936,575. Loans contracted, \$1,707,000. The decline in silver was the subject of general remark by Mint Director Leech, while temporarily in the city, the decline having been about 2¢ since July 1, which Mr. Leech did not profess fully to understand. "The general course," he said, "seems to be the feeling that silver is losing caste as a money metal. Of course, if the International Monetary Conference should result in a plan to bring silver into more general use the price would rise again. Ex-Secretary Sherman, in a Western speech, is quoted as saying that in his opinion "the only course for the Government to pursue is to issue a silver dollar of 550 grains, if necessary, equal in value to one dollar in gold. From the highest price this year for silver bullion certificates, 95½, reached early in January, the decline was steady, increasing in rapidity until the silver scare of August marked down the quotation to 82½ cents per ounce, the lowest in the history of the metal.

Exchange was easy in consequence of a good supply of commercial bills until the latter part of the week, when cotton rose above the parity of Liverpool, thus checking shipments, and the rates for actual business became firmer. The market was weaker again on Friday, in consequence of the flurry in money, but it closed steady at \$4.86½ @ \$4.88.

Coal Market.

The Anthracite Coal trade is stimulated by the approach of cold weather and a gradual improvement is noticed. A difficulty which had been anticipated is the scarcity of cars, and this fact is mentioned by a Pottsville paper as reason for the closing of 28 collieries in that region last week, and according to the same authority, orders are coming forward with much urgency, so that the railroads will be fully occupied during the present month. The Eastern trade is still quiet, storage room in that section seeming to be lacking, but in the West there is a disposition to hasten deliveries before the 15th inst., when an advance of 25¢ per ton in freight to Chicago takes effect. Production for the week ending 1st inst. slightly exceeded 1,000,000 tons, the heaviest increase being from the Schuylkill region. This is 142,700 tons in excess of shipments for the corresponding week last year, and the total since January 1 is 30,587,000 tons, an increase of nearly 1,900,000 tons compared with the same period in 1891. No diminution in the output is looked for much before the end of the year.

The Reading Railroad Company's fleet now numbers 10 steamers and 19 barges, exclusively engaged in the coasting Coal trade.

Statistics given out by the Bureau of Labor Statistics of Illinois show that the daily wages of Coal miners in that State have increased during the year 15.6%.

A novel piece of labor-saving machinery, says a contemporary, is being introduced at the collieries, and at one of them it has displaced five men and two mules. It is called a pneumatic culm conveyor. It consists of a common pipe, through which a blast of air is driven. Into this pipe, in front of the blower, the culm is let slide and the blast takes it up and conveys it to its destination. By this method culm is taken from the breakers at the rate of 1 ton a minute and deposited a mile away.

Judge Ross of the United States District Court in San Francisco decides that shippers of imported Bituminous Coal for use in the coasting trade are entitled to a drawback of 75¢ per ton.

Some of the richest veins of Coal in the lower Anthracite region have been struck

a few miles west of Tamaqua, Pa. A vein of the finest quality runs from 12 to 25 feet in thickness.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, TUESDAY, October 11, 1892.

Scotch warrants have declined to 41/9 @ 41/10½ and Cleveland to 39/. while Hematites moved up to 49/10½. The stock of Scotch in public stores has decreased to 371,000 tons, but that of Cleveland remains at very close to 10,000 tons, the returns showing only 21 tons decrease for the week. Dealings have been on a moderate scale throughout the week. The only new feature in the situation is that returns for last month show an increase of 7161 tons in production in Cleveland and that additional furnaces have since been lighted, leading to the belief that there will be an accumulation in makers' hands this month. Exports in September were 80,000 tons, against 87,000 tons during the corresponding month last year.

Pig-Tin market has been quite active during the week, with sharp fluctuations in prices, and the average higher. Realizations have led to some reaction, but the market has the support of better consumptive demand, in addition to freer speculative dealings.

In the Copper market there is a more cheerful feeling, and prices have advanced quite sharply. Reduced supplies impart some confidence, but the market has gained more support from heavy buying by leading firms, together with freer buying by leading operators. There has been a good inquiry from India, and home consumption is better. Furnace material is at present sparingly offered.

The Tin-Plate market at Swansea has been rather weak, with business chiefly of a retail character. The only exception was in the instance of high-grade Bessemer, a large sale of which was made at 11/6, f.o.b., for 14 x 19½. Exports in September 30,000 tons, against 26,000 tons last year. Amount sent to United States, 22,000 tons and 11,000 tons respectively.

Scotch Pig Iron.—Business fairly active; mostly November and later delivery, at somewhat modified prices.

| | |
|--|------|
| No. 1 Coltness, f.o.b. Glasgow..... | 55/ |
| No. 1 Summerlee, " "..... | 54/ |
| No. 1 Gartsherrie, " "..... | 52/ |
| No. 1 Langloan, " "..... | 53/6 |
| No. 1 Carnbroe, " "..... | 44/6 |
| No. 1 Shotts, " at Leith..... | 52/6 |
| No. 1 Glengarnock, " Ardrossan..... | 51/ |
| No. 1 Dalmellington, " "..... | 49/ |
| No. 1 Eglinton, " "..... | 47/ |
| Steamer freights, Glasgow to New York, 1/; | |
| Liverpool to New York, 7/6. | |

Cleveland Pig.—There is no improvement in the demand, and the market is rather weak at 39/, f.o.b. shipping port, for No. 3 Middlesborough.

Bessemer Pig.—Dealings moderate, but makers' prices held quite firmly at 50/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Ferromanganese.—Demand moderate, but the offering reserved, with sellers quite firm. English 80% quoted at £11. 11/3, f.o.b. shipping port.

Steel Rails.—The market has been quieter and prices are without change. Heavy sections quoted at £4. 2/6, f.o.b. shipping port.

Steel Billets.—Slow business and sellers at rather easier prices. Bessemer, 2½ x 2½ inches, quoted at £4. 2/6, f.o.b. shipping point.

Steel Blooms.—The market remains dull and unchanged. Makers quote £4 for 7 x 7, f.o.b. shipping point.

Steel Slabs.—There is very little doing and prices are rather weak. Bessemer quoted at £4., f.o.b. at shipping point.

Old Iron Rails.—Business moderate, but sellers stand for previous prices. Tees quoted at £2. 15/ and Double Heads at £2. 16/3 @ £2. 18/9, f.o.b.

Scrap Iron.—The market remains quiet, but sellers hold firmly. Heavy Wrought Iron quoted at £2. 5/ @ £2. 7/6, f.o.b.

Crop Ends.—Market quiet and without change. Bessemer quoted at £2. 10/ @ £2. 12/6, f.o.b.

Manufactured Iron.—Business has been slow and the demand at present is moderate. We quote, f.o.b. Liverpool:

| | | | | | | |
|--------------------------------|---|----|----|---|----|----|
| | £ | s. | d. | £ | s. | d. |
| Staff. Ordinary Marked Bars | 8 | 5 | 0 | 6 | 10 | 0 |
| Common | 6 | 7 | 6 | 6 | 10 | 0 |
| Staff. Bl'k Sheet, singles.... | 7 | 5 | 0 | 6 | 10 | 0 |
| Welsh Bars (f.o.b. Wales).... | 5 | 7 | 6 | 5 | 10 | 0 |

Tin Plate.—Liverpool market fairly firm, but quiet. We quote, f.o.b. Liverpool:

| | |
|-------------------------------------|-------------|
| IC Charcoal, Alloway grade..... | 13/6 @ 14/ |
| IC Bessemer Steel, Coke finish..... | 12/ @ 12/3 |
| IC Siemens " "..... | 12/3 @ 12/6 |
| IC Coke, B. V. grade 14 x 20..... | 12/ @ 12/3 |
| Charcoal Terne, Dean grade..... | 11/9 @ 12/ |

Pig Tin.—The market strong at the close and fairly active, with Straits quoted at £94.5/ for spot and £94. 17/6 for three months' futures.

Copper.—Prices fairly firm at the close, and the demand active. Merchant Bars quoted at £45. 12/6 spot, and £46. 2/6, three months' futures. Best selected, £50.

Lead.—There has been only a moderate business, but prices are steady at £10. 10/ for Soft Spanish.

Spelter.—The market is quiet but firm, with £18. 15/ quoted for ordinary Silesian.

Imports

Hardware, Machinery, &c.

Curley, J. & Bro., Cutlery, cs., 1
 Chelsea Jute Works, Machinery, cs., 8
 Downing, R. F. & Co., Machinery, cs., 10
 Folsom Arms Co., Arms, cs., 9
 Goddard, J. W. & Sons, Hdw., cs., 3
 Hammacher & Schlemmer, Nails, cs., 93
 Hartley & Graham, Arms, cs., 5
 Kayser, Julius, Mach'y, pgs., 8
 Meacham Arms Co., Arms, cs., 13
 Newton & Shipman, Files, pgs., 7
 Pariser, B., Ironware, cs., 14
 Schlaick, Louis, Horseehoes, cs., 5
 Sellers, W. B. & Co., Mdse., cs., 2
 Schoverling, Daly & Gales, Arms, cs., 11
 Schwarze, J. & Co., Mach'y, cs., 2
 Vogt, Heimer J., Mach'y, cs., 3
 Wiebusch & Hilger, Hdw., cs., 11; Chains, cks., 35
 Werlemann, H., Arms, cs., 28
 Winchester Arms Company, Arms, cs., 2
 Wyman, Chas. H., Arms, cs., 4
 Ward, Jas. E. & Co., Chains, 9; Anchors, 23
 Order: Gun Barrels, cs., 8; Mach'y, cs., and pgs., 30

S. B. Harrington, president of the Harrington & King Perforating Company, Chicago, started on the 4th inst. on a Southern tour of several weeks' duration.

Glass.—There have been no features of interest in the Glass market during the past week, as comparatively little business has been done at the new prices. It is reasonable to suppose that most, if not all, of the large and important orders had been booked by the factories late in the summer, or at least before any change was made in prices. The change, therefore, comes in the shape of protection to the jobbers, and does not affect the cost of their fall stocks. It is too early to know how closely new prices are adhered to for new business, particularly as the number of contracts made with factories has been limited during the past week. The advance on French Glass appears to be well sustained. The volume of business in both American and French Glass is reported as satisfactory by local jobbers and importers, although there is complaint in some cases of the prices at which consumers want to buy Glass and of the small profits realized. The market is still in an unsettled condition, especially in American Glass, and it remains to be seen whether present quotations will represent the figures at which Glass will be sold. Quotations remain unchanged, as follows: American Window Glass, 1000-box lots or more, 80 and 20 per cent. discount; carloads, 80, 10 and 5 per cent. discount; less than carloads, 80 and 10 per cent. discount. French Window Glass, 80 per cent. discount. American Plate is held at a discount of 50, 10 and 5 per cent., and imported Plate at a discount of 60 per cent.

Technical Hardware Terms Explained.

EACH LINE of trade or manufacturing has technical names, recognized standards and mechanical details that are constantly used in the course of production and application. Such terms as are in use both in the factory or shop and in the salesroom are as "Greek" to the layman or uninitiated, and still must be understood by purchaser before he can intelligently explain what he desires. Take as an instance a person desiring to purchase a line of door and window Hardware: The first question arising is, 1. What hand are the doors? 2. Are the doors regular or reverse bevel? 3. Are the door stiles beveled or straight? 4. If hinge straps are used, what offset and return is necessary? All these questions come up in the course of the work of completing a line of Hard-

ware trimming, and the failure to get the necessary details or the inaccuracy of the details when gotten is the one large and prominent "snag" upon which the layman is likely to run, and even in the factory and salesroom the aforementioned de-

tails are the cause of no little trouble and delay. Hands, bevels and offsets and returns are forever being mixed up.

THE HAND OF A DOOR

is determined as follows: 1. All doors are supposed to open in, and when doing so are termed regular. 2. Doors that open out, or doors that open toward the

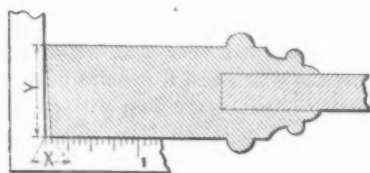


Fig. 3.—The Bevel of a Door.

person when entering a room, are termed reverse bevel. Fig. 1 represents regular right and left hand doors, while Fig. 2 represents right and left hand reverse-bevel doors. A practical demonstration of how to determine the hand of a door is as follows:

Suppose a person to be standing in front of door A, Fig. 1. Let the person grasp the knob with his left hand and proceed to walk in the room, still retaining a hold on the knob; it will be seen at once that it will be necessary for the person to turn

tends to make them, to a more or less degree, weather proof. The rabbet is shown in Fig. 4. The amount of rabbet is indicated by the dotted lines and space Z. While there is no standard in regard to rabbet, it is generally understood that $\frac{1}{2}$

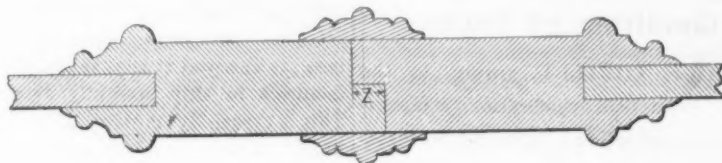


Fig. 4.—The Rabbet of a Door.

inch is regular, and on this basis the lock manufacturers make their standard goods. If the architect had in mind, when designing the plans, that there are details of measurement generally adhered to, much delay in completing house trimming might be obviated. A detail of Hardware trimming that is less easily comprehended than any of the ones aforementioned is that relating to

HINGE STRAP OFFSET AND RETURN.

The modern arrangement of hinge strap and door butt in separate parts brings in

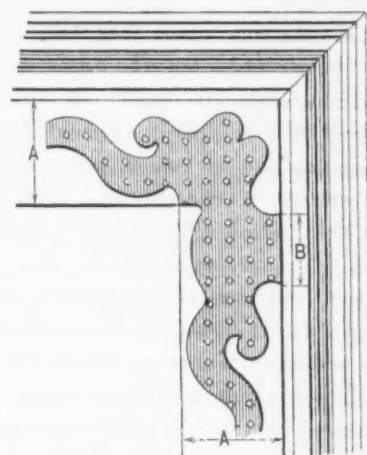


Fig. 5.—Application of a Hinge Strap to Rail and Stile.

details of measurements that, while not intricate, seem to be a stumbling block that cannot be removed. This fact has become so thoroughly impressed on the manufacturer that many of the leading houses keep stereotyped prints of a door

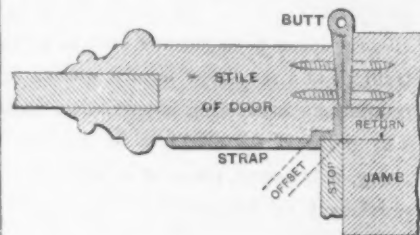


Fig. 6.—Offset and Return of Hinge Strap.

section showing the application and necessary measurements in reference to hinge straps. Figs. 5 and 6 show the outside of a door with strap applied, and also a section of a door which illustrates the necessary figure to be obtained. In Fig. 5 the necessary dimensions are shown by dotted lines, width of stile and width of rails,

THE BEVEL OF A DOOR

is the term relating to edge of door stile in which the lock is arranged. Bevel on a door is necessary as a matter of clearance, and the amount necessary is regulated by the varying thickness—a thick door requiring more than a thin one. Fig. 3 shows the manner of determining the bevel of a door. This is done by applying a try square to edge of stile. The distance from edge of door, as indicated by dotted lines and space X, to inside of square, is the required bevel, and is given together with Y, the thickness of door. The acknowledged trade bevel is $\frac{1}{2}$ inch in $2\frac{1}{4}$ inches. Closely allied to bevel is the

RABBET OF A DOOR,

as they both relate to stile arrangement and are often used together. As a rule, double doors are made rabbeted, as this arrangement strengthens the doors and

and also the size of butt which is to hang door. In Fig. 6 the dimensions required are, 1, depth of stop bead; 2, distance from outside edge of door to edge of butt leaf. The former is called the offset, the latter the return. In all instances where the Hardware can be fitted from the plans it is well to have sectional drawings made showing doors as explained.

Trade Items.

THE ANNUAL MEETING of the stockholders of the Blair Mfg. Company, Springfield, Mass., was held September 26, and brought about several important changes in the management of the concern. J. S. Blair having disposed of his interest to W. A. Loud and A. B. Case, retired from the presidency. Mr. Buxton, formerly treasurer, also retires, and Messrs. Loud and Case, who have been with the company since its organization in 1879, and to whom much of its growth and prosperity is due, succeed to the offices of president and treasurer, respectively, and C. L. Brooks becomes secretary. The business of manufacturing Lawn Mowers will be continued under more favorable conditions than before, new machinery having recently been put in and the system of manufacture greatly improved. To their well-known line of Lawn Mowers have been added several specialties, including Lawn Sprinklers, Turf Edgers and Grass Collectors. The Blair Mfg. Company have become well known in this country and abroad, and only last week shipped goods to the Pacific Coast, Australia and Calcutta. The company report the outlook for business for the coming season as bright.

THE NUBIAN IRON ENAMEL COMPANY of Cragin, Ill. (a Chicago suburb), have favored us with their quarterly desk calendar for the last quarter of 1892. Each day's leaflet bears some taking reference to Bonnell's Nubian. Accompanying the calendar are circulars referring to the special merits of Nubian. One of these circulars is of the shape and general semblance of the tin can adopted August 1, 1888, to hold Nubian Iron Enamel.

PORTSMOUTH WRENCH COMPANY, 151 Congress street, Boston, Mass., in an advertisement in this issue, call attention to their well-known Always Ready Wrench, which they state they are now able to supply in any quantity, having recently added to their manufacturing facilities.

WALTER ADAMS, 116 Chambers street, New York, is sole export agent for the Never-Slip Can Opener, a description of which appeared in our last issue.

M. PRICE, Newark, N. J., issues a circular in which he announces that the Edge Tool business established by him in 1847, and which he has personally conducted ever since, together with all of his factory brands, machinery and tools, has been sold to L. A. Sayre, manufacturer of Hardware Specialties, Newark. Mr. Price has retired from the business, which will be continued by Mr. Sayre, who is referred to as being thoroughly acquainted with its details.

THE LARGE HARDWARE STORE of W. A. Thomas & Co., Culpepper, Va., was destroyed by fire on the 7th inst. The loss is partly covered by insurance.

THE ADVERTISEMENT signed "Pacific Coast" among the Special Notices in this issue is deserving the careful attention of manufacturers who are desirous of having a representative in the Northwest. The gentleman who thus announces his intention to represent manufacturers of

Hardware, Pipe and Fittings, Stamped and Pieced Tinware and kindred lines in the territory mentioned is well known to the trade as a successful business man who can readily furnish the highest references to those who may not be acquainted with him, and his connections are such as to give him exceptionally favorable opportunities for reaching the trade in Oregon, Washington, Idaho and Northern California, with headquarters in Portland, Ore. The opportunity is certainly deserving the attention of those who are desirous of making such an arrangement for the marketing of their goods in the Northwest.

J. H. WALLESER has opened a new Hardware store at Fairbank, Iowa. Mr. Waller was formerly a member of the Hardware firm of Gochmour & Waller, the business of which is now being conducted by H. R. Gochmour.

THE GRINDING AND FINISHING SHOPS of the Axe and Hatchet factory of the American Axe and Tool Company at Ballston, N. Y., were destroyed by fire on the 7th inst. The company advise us that the fire will cause some delay in deliveries of Blood's Axes and Tools, but will not in any way affect the shipments of Scythes, which are made in a separate factory.

THE ANNOUNCEMENT of an auction sale by Haydock & Bissell, 12 Murray street and 15 Park place, New York, appears among the Special Notices in this issue. This sale is by order of the Lalanc & Grosjean Mfg. Company and the St. Louis Stamping Company, and will comprise Agate, Granite and Blue and White Ware seconds, a line of Stamped Tinned Ware, Polished Fry Pans, Tea and Table Spoons, &c. A large assortment of Hardware, Edge Tools, Screws, Shovels, Spades and Scoops will also be disposed of. The above sale will take place on Tuesday and Wednesday, October 18 and 19.

Sporting Goods Wall Cases.

STORRS & CANDEE, Hartford, Conn., give considerable attention to Sporting Goods. Last spring they maintained an aquarium in one of their front windows, with a half-dozen large trout. This they

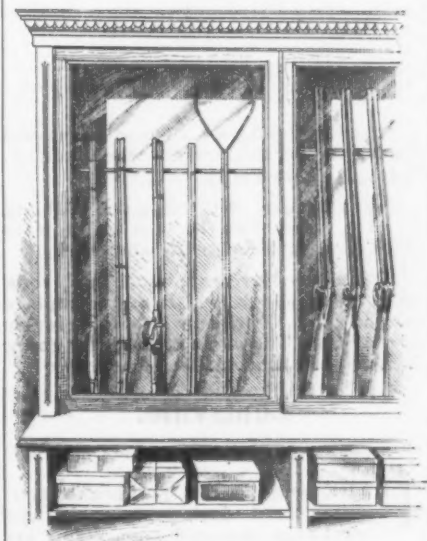


Fig. 742.—Sporting Goods Wall Cases.

considered a good advertisement, though it was somewhat difficult for them to get the fish and keep them supplied with fresh running water. They arrange Fishing Rods, Guns, &c., in shallow upright cases, with sliding glass doors, as shown in Fig. 742. This arrangement is re-

ferred to as showing the goods to good advantage.

Calcium Chloride to Prevent Rust.

FOR THE PREVENTION of rust accumulating on Cutlery and other polished steel goods J. Curley & Brother, 6 Warren street, New York, take advantage of the fact that calcium chloride has an affinity for moisture. A bottle in which is a glass funnel is placed in the case with the goods, and the funnel partly filled with lumps of calcium chloride, as shown



Calcium Chloride for Polished Steel Goods.

in the cut. Every trace of moisture will be speedily absorbed, and the arrangement of the bottle and funnel permits the liquefied portion of the calcium chloride to trickle from the funnel into the bottle, drop by drop, leaving the salt exposed, so that it continues active until it entirely dissolves. This is an inexpensive way of keeping fine goods from rusting, and avoids a large amount of tire-some labor.

Important Consolidation.

THE NEW YORK WIRE CLOTH COMPANY have been organized to succeed to the various interests and business heretofore carried on by the following concerns:

The Wire Fabric Company, Homer, N. Y.

J. H. DeWitt's Sons, Brooklyn, N. Y.

York Wire Cloth Company, York, Pa.

Hamilton Wire Cloth Company, Hamilton, N. Y.

The new company are now in the market with all of the well-known brands of Wire Cloth formerly manufactured by the above firms. The capacity of the different mills is referred to as 60,000,000 square feet per annum. The officers of the company are as follows: J. Maus Schermerhorn, president; J. M. Mertens, vice-president; W. P. DeWitt, treasurer, and F. J. Root, secretary. The managers of the works controlled by the company are Chas. A. Skin-

ner, Homer, N. Y.; J. H. DeWitt, Brooklyn, N. Y.; J. W. Eisenhart, York, Pa., and F. J. Root, Hamilton, N. Y. 53 Chambers street, Stewart Building, is the New York office of the company, and it is requested that all correspondence relating to their affairs be addressed thereto.

Cordage Interests.

TRAVERS BROTHERS COMPANY, 107 Duane and 16 Thomas streets, New York, have completed their rope plant, and have added pure Manilla and Sisal Rope to their line of Twines, Threads, Hammocks and Sash Cords. This will be of interest to the Hardware trade, as the company are now prepared to furnish the trade with these goods direct from the factory. They are making pure Manilla and Sisal Rope from $\frac{1}{8}$ inch to 6-inch, and will in the near future manufacture a full line of Italian Rope, which is in demand for vessels and which, they state, is not now made in this country. Manufacturing Rope completes the last link in their chain of goods. From this factory a merchant can supply himself with anything in Cordage from Shoe Thread to a Hawser, buying his entire line of these goods under one roof. The principal goods which the Hardware trade are interested in are, of course, Rope and Sash Cord. The company are able to supply the latter in any grade, from the best braided to the cheapest goods. This company are not connected with any trust.

It is reported that a certificate of incorporation of the John Good Cordage and Machinery Company was filed at Trenton, N. J., with the Secretary of State, October 6. While no definite information could be obtained at the office of John Good, it is understood that the company will have a capital of \$7,000,000, divided into 70,000 shares at a par value of \$100. The incorporators named are John Good of Far Rockaway, N. Y.; John G. Jenkins of Brooklyn, N. Y.; F. D. Hallowell of Brooklyn, N. Y.; Isaac N. Hubbard of Montclair, N. J.; Martin Deyitt and John L. Wilten of Jersey City, N. J., and William H. Williams of Orange, N. J. The principal place of business, it is reported, is to be Jersey City, and the object of the company the manufacturing and selling of Cordage, Binding Twine and similar commodities and the manufacture of Machinery and the making of the same. It is stated that their charter is for 50 years, and that active operations will begin at once. The above announcement was a surprise to the Cordage trade, as no intimation of the formation of the company had been given. It was stated by a representative of the company that it was too early to say what their policy regarding prices would be.

It Is Reported--

That the Alderman Hardware Company have recently commenced the retailing of Hardware and Stoves at Wilmington, N. C.

That an unsuccessful attempt was made to burglarize the Hardware store of

John F. Thomas & Sons, York, Pa., on the 4th inst.

That the Hardware store of Charles M. Irvin at Jersey Shore Pa., was entered by burglars on the 1st inst., and a quantity of Razors stolen.

That Logan & Campbell have succeeded the Hardware firm of Cray & Parsons, Delevan, Wis.

That J. A. Ramsdell, dealer in Hardware, Harriman, Tenn., was damaged by fire a short time since. The loss is about \$8,000; insurance, \$3,000.

That P. W. Bunly, of the Lowry Hardware Company, Atlanta, Ga., was married to Miss Cordeia Latham, at Atlanta, on the 28th ult.

That the Hardware store of Wallace & Quigg, Oswego, N. Y., was slightly damaged by fire on the 29th ult.

That F. M. Ready's Hardware stock at Sanger, Texas, was damaged by fire on the 29th ult. The loss was \$200.

That F. W. Heitman & Co., Houston, Texas, are fitting up a new establishment for the accommodation of their increasing business.

That J. M. Phillips, who was formerly in the Hardware business at Shenandoah, Iowa, has just bought out the stock of W. W. Work, in the same line, at Erie, Kan., and will remove there at once.

Wire-Nail manufacturers have been able to dispose of their output readily, with the exception of one or two new factors who find it necessary to hunt lustily for business, but as the Cut-Nail trade gradually fades out of existence the present output of Wire Nails will not prove any incubus in the markets. Barbed Wire has enjoyed a heavy demand, and the sales will continue for a month or more yet.

Common Carriage and Machine Bolts are stiffened very much, with probability of continuing, as one of the large factories has just started up again after lying idle for several months.

The excessive drought has caused almost entire suspension of water freights both from the Pittsburgh and Wheeling districts, and also has affected shippers from this and neighboring cities. The country products depending on the rivers for outlets can be brought to the cities by the small flat-bottom packets that run in 2 feet of water.

The railroads have profited by the low water, and are doing heavy business both ways.

A Novel Showcase.

AMONG the many convenient arrangements for displaying Hardware in the establishment of C. Morgan's Sons,

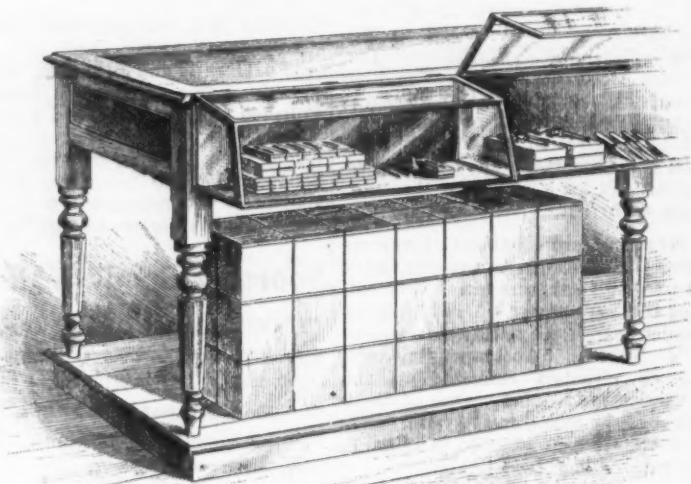


Fig. 743.—A Novel Show Case.

That Hardwicke & Co. have purchased the Hardware business of the late H. S. Ware, Niagara Falls, N. Y.

That Samuel Willyoung of Albion, N. Y., has bought the Hardware stock of G. L. Merrill, Orleans, N. Y.

That a new Hardware stock will soon be put in at Glenwood, Iowa, to replace that of John O'Brien, who was recently burned out. The name of the party going in is as yet unknown.

Louisville.

(From a Special Correspondent.)

TRADe continues in a most healthy condition, and during the past two weeks has increased remarkably, yet everything points a little downward in prices. Freights from the East have recently advanced on fifth and sixth classes of goods, taking fourth and fifth rates respectively. This has caused a slight advance in prices to dealers, although they say manufacturers will even it up to them. Bar Iron is offered in just about sufficient quantities to be readily taken up by the trade. The mills are able to sell all they make and are running full, hence it is to be supposed they are making money. The

Wilkesbarre, Pa., none is found more useful than the showcase shown in Fig. 743. This extends along the front edge of the counter to the left of the entrance. It is used to display odds and ends, and such stock of small goods as they are desirous of cleaning out. The goods in it can hardly escape the notice of every customer entering the store, and the lid opens in such a manner as to give ready access to its contents. Showcases are arranged on the top of the counter in the usual manner, the one on the corner being a high one, devoted to a handsome display of Pocket Cutlery. This style of counter replaced the closed pattern some time since, the space underneath being used for storing goods in full packages. The stock carried includes fine Cutlery, Tools, Hardware, Building Material, Doors, Sash, Blinds, Painters', Blacksmiths', and Carriage Makers' Supplies, and House Furnishings. In connection with the business a sash and blind factory and planing mill is carried on.

Price-Lists, Circulars, &c.

FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.: Fall circular of Coal Hods, Vases, Cow Ties, Huskers, Elbows, Pokers, Stove Shovels, Stove Boards, Sleds, Skates, Snow Shovels, Oil Stoves, &c. The circular contains 52 pages of illustrated and descriptive matter. In presenting this circular the company call attention to their large and complete assortment of all lines of seasonable goods.

THE SAM'L C. TATUM COMPANY, Cincinnati, Ohio: Price-list of Hardware specialties, Grocers' Fixtures, Machine-Molded Pulleys, Hangers, Couplings, Journal Boxes, &c. The illustrated Hardware specialties include Mail Boxes, Twine Boxes, Casters, Dumb Bells, Quoits, Shelf Brackets, Cabinet Scraper, Bracket Shelving Irons, Trucks, Broom Holders, &c.

RECTOR & WILHELMY COMPANY: Guns, Rifles, Revolvers, Sportsmen's Clothing, Ammunition, Dog Furnishing, &c. Their No. 114 illustrated catalogue is devoted to these goods, accompanied by a discount sheet. They do not send out goods on approval, but state that all their American guns are of well-known make and established reputation, and that they will shoot in accordance with the manufacturers' targets, if properly loaded and used.

A. TREDWAY & SONS, Dubuque, Iowa. Fall circular, 1892. Illustrations are given of Axes, Stove Boards, Elbows, Dampers, Coal Hods, Registers, Stove Polish, Hay and Corn Knives, Scoops, Baskets, Corn Huskers, Ammunition, Lanterns, Meat Cutters, Saws, &c. Particular attention is called to Cutlery handled by this firm.

CRAIGHEAD & KINTZ COMPANY, New York and Ballardvale, Mass.: Daylight Lamps with Indicators. A pamphlet devoted to an illustrated explanation of their Optical indicator, which is designed as an effective guard against overflowing while filling the lamp.

THE PECK, STOW & WILCOX COMPANY, New York and Southington, Conn.: Little Giant Meat Chopper. A circular is devoted to this article illustrating the cutter with the different attachments, and showing their new clamp used on this machine. The fact is emphasized that these cutters are tinned.

THE ADAMS & WESTLAKE COMPANY, Chicago, Ill.: Brass Bedsteads. Their catalogue No. 5 is devoted to illustrations, descriptions and prices of these goods. A large variety of styles are shown, including elaborate and handsome patterns, as well as those of plainer design. The catalogue is handsomely gotten up, and corresponds with the goods illustrated.

BINDLEY HARDWARE COMPANY, Pittsburgh, Pa.: Catalogue of fall and winter goods, 1892-93. Illustrations, prices and descriptions are given of Fire Irons, Fire Shovels, Coal Tongs, Fire-Iron Stands, Coal Vases, Coal Hods, Wrought-Iron Fenders, Brass Fenders, Stove Pipe, Dampers, Measures, Meat Choppers, Lanterns, Wringers, Door Bells, Coffee Mills, Drip Pans, Sad Irons, Sieves, Slaw Cutters, Registers, Game Traps, Rat and Mouse Traps, Carpet Sweepers, Oil Cans, Shovels, &c. Particular attention is directed to their Peculiar Razor, Carvers, Barbed and Plain Wire. The catalogue contains 48 pages, the style being similar to their large catalogue.

CADY MFG. COMPANY, Auburn, N. Y.: Cady Water Filter and Cooler. The Filter is cylinder shaped, the water being forced through the filtering material and discharged through pipe connections into a storage reservoir. Under pressure of 30 pounds the Filter, it is stated, will deliver about 5 or 6 gallons of the purest of filtered water per hour. The storage reservoir contains four gallons, and is so arranged that when water is drawn from the reservoir a valve opens

automatically and the water is replaced. The ice for the reservoir is contained in a separate compartment, and does not come in direct contact with the water.

Exports.

PER BARK "CARLO," SEPTEMBER 26, 1892, FOR
CAPE TOWN, SOUTH AFRICA.

By **W. B. Fox & Bro.**—6 cases Hardware, 2 cases Sausage Stuffers.
By **Norton & Son.**—122 coils Manila Rope.
By **M. Berliner.**—11 cases Machinery, 12 crates Stoves, 25 kegs Nails.
By **H. W. Peabody & Co.**—1 box Leather Belting.
By **R. W. Forbes & Son.**—72 kegs Nails, 4 cases Hardware, 3 crates Handles.
By **Edward Miller & Co.**—1 barrel Lamp Goods.
By **Sherman & Lyon.**—2 cases Shovels, 50 cases Axes.
By **Haase & Vaughan.**—1 box Lamps.
By **R. W. Cameron & Co.**—25 kegs Nails, 1 box Lamp Goods.
By **Strong & Trowbridge.**—10 cases Scales, 2 cases Hammers, 12 cases Axes and Hatchets, 6 cases Axes.
By **Arkell & Douglas.**—3 dozen Bench Screws, 1 Tool Rack, 1 case Shovels.
By **W. H. Crossman & Bro.**—90 kegs Nails, 26 packages Agricultural Implements and parts.
By **Coombs, Crosby & Eddy.**—1 case Ladders, 50 reels Barb Wire, 3 dozen Stuffers, 2 cases Hardware, 1 case Traps, 6 cases Lanterns, 4 cases Hardware, 1 case Traps, 1 dozen Hardware, 10 dozen Handles, 3 dozen Hammers.
By **Arkell & Douglas.**—10 Wheelbarrows, 20 reels Barb Wire.

PER BARK "HULDA," OCTOBER 1, 1892, FOR
BRISBANE, QUEENSLAND.

By **R. W. Forbes & Son.**—4 cases Shovels, 3 cases Cartridges and Shells, 4 cases Guns and Tools, 2 cases Bolts and Nuts, 2 cases Axes, 5 cases Sledges and Bush Hooks, 1 case Drills, 1 case Hose, 4 cases Axes, 6 cases Nuts and Bolts, 2 cases Wringers, 14 packages Nails and Tacks, 14 packages Tinware, 51 packages Lampware, 33 packages Fruit Jars, 4 scales, 1 dozen Hay Knives, 24 packages Hardware, 1 case Shovels, 4 cases Hammers, 63 boxes Axes and Picks, 71 packages Handles.
By **Strong & Trowbridge.**—2 cases Plated-ware, 19 dozen Lampware, 1 case Guns and Tools, 1 case Rifles, 2 cases Guns, 4000 Cartridges, 1 case Hammers, 2 cases Lampware, 1 case Guns, 5 cases Cartridges, 2 cases Shot Shells, 1 case Hammers, 1 case Shovels and Spades, 1 case Hammers.
By **H. W. Peabody & Co.**—2 cases Hardware, 197 pounds Bolts, 2 cases Iron Castings, 16 pounds Nails, 27 packages Hardware, 1 case Cord, 40 Emery Wheels, 54 dozen Handles, 110 packages Stoves, &c., 1 barrel Lampware, 6 cases Corn Mills, 6 crates Handles, 24 packages Hardware, 38 packages Stoves, &c., 16 crates Stoves, 3 cases Rat Traps, 59 packages Stoves, &c., 31 packages Hardware, 1 case Wringers, 10 crates Churns, 35 cases Handles, 5 cases Nails, 53 cases Hardware, 13 packages Iron Castings, 6 cases Guns, 54 cases Cartridges, 4 cases Shells, 2 cases Primers, 1 case Tools, 2 packages Hardware.
By **Henry Disston & Sons.**—2 cases Hardware.
By **Manhattan Brass Company.**—4 packages Lamp Goods.
By **Buffalo Forge Company.**—4 cases Forges and Blowers.
By **Meriden Britannia Company.**—3 boxes Silver-Plated Ware, 1 box Plated Ware.
By **the Goulds Mfg. Company.**—12 cases Pumps.
By **F. & J. Meyer.**—2 cases Axes, 2 cases Hardware, 1 dozen Potato Hooks, 1 bundle Rules.

PER SHIP "IVANHOE," SEPTEMBER 19, 1892,
FOR SYDNEY, N. S. W.

By **Meriden Britannia Company.**—31 barrels Silver Ware.
By **E. W. Harrison.**—5 cases Pumps.
By **J. Matthews & Co.**—1 case Hardware.
By **Edward Miller & Co.**—1 case and 34 packages Lamp Goods.
By **W. & B. Douglas.**—6 boxes and 1 cask Pumps.
By **the Withington & Cooley Mfg. Company.**—9 cases Forks and Handles.
By **the Fairbanks Company.**—26 boxes Scales, 2 cases Money Drawers.
By **A. S. Lascelles & Co.**—20 cases Axes, 1 case Spades, 26 cases Axes, 6 cases Picks, 4 cases Hatchets, 6 cases Picks, 1 box Builders' Hardware, 12 dozen Broilers.
By **Hartley & Graham.**—2 cases Tools, 1 case Fire Arms, 7 cases Empty Cartridges, 1 case Tools, &c.

By **Edward Miller & Co.**—4 boxes Lamp Goods.

By **the Union Nut Company.**—13 cases Iron Bolts.

By **F. & J. Meyer.**—2 cases Hoes, 18 cases Axes.

By **W. E. Peck.**—1 case Lamp Goods.

By **Rogers, Smith & Co.**—16 packages and 1 box Silver-Plated Ware.

By **Winchester Repeating Arms Company.**—5 cases Guns, 2 cases Tools, 17 cases Cartridges, 1 case Primers.

By **W. K. Freeman.**—1 case Brushes, 4 cases Guns, 3 cases Cartridges, 1 case Primers, 12 cases Axes, 3 boxes Hardware, 12 boxes Tools, 1 case Hardware, 2 cases Drills, 1 box Scales, 9 boxes Oil Stones.

By **R. W. Forbes & Son.**—2 cases Guns, 4 cases Road Scrapers, 3 packages Chain Belting, 1 dozen Saw Cutters, 1 box Wrenches.

By **Edward Miller & Co.**—7 packages Lamp Goods.

By **Arkell & Douglas.**—10 cases Tacks, 5 cases Wringers, 3 cases Hardware.

By **R. H. Dana.**—1 case Shovels.

By **the F. B. Wheeler Company.**—7 cases Lanterns, 6 cases Refrigerators, 3 cases Whipstocks, 20 cases Hardware, 2 cases Stones, 5 cases Agate Ware, 2 cases Cartridges, 1 case Fire Arms, 1 case Empty Shells, 2 cases Pencils, 6 cases Crayons, 63 packages Wheelbarrows, 17 packages Hardware, 3 cases Churns, 6 cases Stoves, 8 cases Handles, 2 cases Forks and Handles, 3 cases Cartridges.

By **Meriden Britannia Company.**—31 barrels Silverware.

By **E. W. Harrison.**—5 cases Pumps.

By **Edward Miller & Co.**—1 case and 35 packages Lamp Goods.

By **W. & B. Douglas.**—6 boxes and 1 case Pumps.

By **the Withington & Cooley Mfg. Company.**—9 cases Forks and Handles.

By **the Fairbanks Company.**—26 boxes Scales, 2 cases Money Drawers, 3 boxes Wooden Pulleys, 1 case Valves.

By **A. S. Lascelles.**—20 boxes Axes, 1 case Spades, 26 cases Axes, 6 cases Picks, 4 cases Hatchets, 6 cases Picks, 1 box Builders' Hardware, 2 boxes Broilers.

By **Hartley & Graham.**—2 cases Tools, 1 case Fire Arms, 7 cases Empty Cartridges, 60 cases Cartridges, 1 case Tools, &c.

By **Edward Miller & Co.**—4 boxes Lampware
By **the Union Nut Company.**—13 cases Iron Nuts.

By **F. & J. Meyer.**—2 cases Hoes, 18 cases Axes.

By **William E. Peck.**—1 case Lamp Goods.

By **Rogers, Smith & Co.**—16 packages and 1 box Silver-Plated Ware.

By **Winchester Repeating Arms Company.**—5 cases Guns, 2 cases Tools, 17 cases Cartridges, 1 case Primers.

By **Willard K. Freeman.**—4 cases Guns, 3 cases Cartridges, 1 case Primers, 12 cases Axes, 2 boxes Valves, 3 boxes Hardware, 12 boxes Tools, 1 case Hardware, 2 cases Drills, 1 box Whips, 17 boxes Scales, 9 cases Oil Stones.

By **R. W. Forbes & Son.**—2 cases Guns, 4 cases Road Scrapers, 3 packages Chain Belting, 5 dozen Saw Cutters, 5 cases Agricultural Goods, 1 box Wrenches.

By **Edward Miller & Co.**—7 packages Lamp Goods.

By **Arkell & Douglas.**—1 case Tacks, 5 cases Wringers, 3 cases Hardware.

By **R. H. Dana & Co.**—1 case Shovels.

By **the F. B. Wheeler Company.**—7 cases Lanterns, 6 cases Refrigerators, 3 cases Whipstocks, 20 cases Hardware, 2 cases Stone, 5 cases Agateware, 2 cases Cartridges, 1 case Fire Arms, 1 case Empty Shells, 2 cases Pencils, 6 cases Crayons, 63 packages Wheelbarrows, 17 packages Hardware, 3 cases Churns, 6 cases Stoves, 8 cases Handles, 2 cases Forks and Handles, 3 cases Cartridges.

By **W. H. Crossman & Bro.**—46 dozen Cow Bells.

By **Strong & Trowbridge.**—1 barrel Plated Ware, 3 packages Stoves, 3 cases Tools, 1 case Lemon Squeezers, 1 case Tools, 6 cases Liquid Glue, 1 case Braces, 1 case Drills, 8 cases Axes, 1 case Hammers, 1 case Castings, 6 cases Axes, 1 case Hammers, 8 cases Axes, 1 gross Rat Traps, 1/2 dozen Sad Irons, 3 gross Lampware, 12 gross Hardware, 18 sets Axes, 21 dozen Hardware, 8 dozen Cow Bells, 7 dozen Hardware, 104 pounds Castings, 30 dozen Axes, 1/2 dozen Wringers, 54 dozen Locks, 1393 pounds bolts, 120 pounds Staples, 2 cases Brass Fittings, 1 case Anti-Rattlers, 1 case Guns, 1 case Hardware, 1 case Braces, 1 case Whip Sockets, 1 case Emery Wheels, 1 case Axes, 16 crates Sarven Wheels, 9 cases Axes, 1 case Washers, 6 cases Nails, 2 cases Castings, 7 cases Bolts, 2 cases Cradles, 1 barrel and 1 case Lampware, 1 case Lemon Squeezers, 6 cases Axes, 1 case Rifles, 1 case Wringers, 1

case Cartridges, 1 case Levels, 1 case Wrenches, 1 case Tools, 2 cases Axes, 4 cases Hardware, 3 cases Bolts, 2 cases Saws, 1 case Guns, 1 case Bolts and Nuts, 2 cases Handles, 1 case Bolts and Nuts, 1 case Hammers, 1 case Wringers, 3 cases Hardware, 1 case Step Pads, 1 case Whip Sockets, 1 case Rifles, 1 case Axes, 1 case Hammers, 1 package Hardware, 1 case Hammers, 1 case Handles, 7 cases Hardware, 2 cases Saws, 7 cases Bolts, 6 cases Nails, 9 cases Axes.

By *W. H. Crossman & Bro.*—1 case Plow Parts, 1 Carbine, 2 Revolvers, 6 dozen Handles, 18 dozen Axes, 6 Rifles, 24 sets Tools, 40,000 Primers, 1500 Shells, 4000 Cartridges, 1 gross Handles, 6 Store Trucks, 5 cases Hardware, 3 crates Handles, 3 cases Snaths, 2 cases Cow Bells, 1 case Plated Ware, 2 dozen Air Guns and Parts, 25 dozen Hatchets, 6 gross Metal Polish, 1 case Plow Parts, 9 cases Shovels, 3 cases Lamp Goods, 3 gross Rat Traps, 40 cases Hardware, 6 bundles Shovels, 2 crates Handles, 6 boxes Hatchets, 40 boxes Axes, 5 cases Cartridges, 1 case Primers, 2 cases Handles, 16 cases and 17 packages Hardware, 2 crates Sifters, 1 case Shovels, 3 cases Handles, 1 case Rifles, 40 dozen Axes, 20,000 Shells, 10,000 Empty Cartridge Cases, 32,000 Cartridges, 200,000 Primers, 186 pounds Oil Stoves, 3 cases and 11 packages Hardware, 11 cases Iron Bolts, 2 Tire Benders, 1 case Pump Parts, 1 case Shovels, 30 dozen Cages, 73 cases Axes, 1 case Handles, 1 case Reloading Tools, 38 cases Hardware, 20 Rifles and Parts, 120,000 Primers.

FOR BRISBANE.

By *H. W. Peabody & Co.*—2 cases Builders' Hardware, 1 case Sandpaper, 1 crate Belts, 1 crate Forks, 1 case Emery Wheels, 1 case Edge Tools, 1 case Brushes, 1 bundle Handles, 1 case Money Drawers, 1 box Rivets, 3 cases Fire Arms, 1 case Cartridge Shells, 50 cases Crayons, 2 cases Handles, 4 cases Iron Castings, 5 packages Oil Stoves, 1 case Rivets, 6 cases Cartridges, 1 case Guns, 1 case Tools, 1 case Primers, 1 case Paper Shells.

By *the F. B. Wheeler Company.*—33 cases Hardware, 3 cases Handles, 2 cases Hardware, 3 cases Windmills, 6 cases Washing Machines.

By *Isley, Doubleday & Co.*—2 cases Hardware, 9 cases Wheels, 1 package Air Rifles, 1 box Traps, 1 case Wire Goods.

By *McLean Bros. & Rigg.*—6 dozen Reflectors, 22 dozen Hardware, 1 Coffee Mill, 6 Drills, 24 dozen Mouse Traps, 2 dozen Mowers, 1 Level, 8 dozen Planes, 26 dozen Wire Goods, 60,000 Oil Cans, 20 dozen Shovels, 4 dozen Stoves, 1 case Locks, 2 cases Lampware, 5 Bone Mills, 2 cases Saws, 2 cases Wrenches, 1 case Lemon Squeezers, 1 case Stove Mats, 3 cases Lamp Burners, 7 cases Wringers, 4 cases Bolts, 9 cases Builders' Hardware, 12 cases Lanterns, 1 case Saw Sets, 15 cases Plows, 1 case Wrenches, 3 cases Coffee Mills, 2 cases Hammers, 6 cases Cork Pullers, 1 barrel Hoes, 25 cases Cartridges, 2 cases Rifles, 4 cases Bolts, 1 case Air Gun, 1½ barrels Blocks, 2 cases Seed Sowers, 2 cases Builders' Hardware, 35 cases Cartridges, 10 cases Drills.

FOR NEWCASTLE.

By *McLean Bros. & Rigg.*—6 Lawn Mowers and 1 bundle Handles, 14 dozen Lamps, 1 barrel Cow Bells, 1 case Padlocks, 1 case Stone Forks, 3 cases Picks, 1 case Screws, 25 cases Lamps, 6 cases Builders' Hardware, 1 case Tacks, 8 cases Cartridges.

PER BARK "VALPARAISO," SEPTEMBER 21, 1892, FOR BRISBANE, AUSTRALIA.

By *Collins & Co.*—54 boxes Edge Tools.

By *the Fairbanks Company.*—2 boxes Scales.

By *Henry Dighton & Sons.*—4 cases Hardware.

By *Meriden Britannia Company.*—12 barrels Silver-plated Ware.

By *Winchester Repeating Arms Company.*—4 cases Guns, 5 cases Cartridges.

By *the F. B. Wheeler Company.*—7 cases Hardware.

By *Toner & Lyon.*—1 case Hardware, 12 cases Liquid Glue.

By *Edward Miller & Co.*—11 boxes and 35 barrels Lamp Goods.

By *S. Hoffnung & Co.*—6 cases Nails, 1 case Handles, 20 cases Handles.

By *F. & J. Meyer.*—1 case Files, 1 case Edge Tools.

By *Arkell & Douglas.*—7 cases Carriage Castings, &c., 36 packages Wind Mills, 7 cases Plows and Parts, 13 cases Scroll Saws, &c., 1 case Plows, 4 cases Springs, 2 bundles Rubber Hose, 1 case Air Guns, 7 cases Axes, 11 cases Fire Arms, 2 cases Traps, 3 cases Bush Hooks, 13 cases Shovels, 600 reels Wire, 4 cases Sifters, 1 case Strops, 19 packages Shovels, 1 case Pencils, 5 cases Nails, 20 crates Stoves, 123 cases Handles, 119 cases Axes, 23 cases Mowers, 42 cases Choppers, 14 cases Tools, 3 cases Rakes, 15 packages Castings, 30 cases Hardware.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

As to the general movement of goods in this line during the past week, reports have been uniformly favorable. Pigments adapted for house painters' use are represented as being taken in quite as full amount as they usually are at this season of the year, and, in some instances, the early October movement would appear to compare very favorably with that of the corresponding period last year. Special lines of Paints might be moved in larger quantity without reaching remarkably heavy volume, yet some of these are more than holding their own in the general movement, and the sales of base materials, according to current report, are on a scale affording pretty strong evidence that manufacturers keep pretty busy. In values the changes are few, and the fluctuation is no wider at present than at any preceding time since the beginning of the autumn season.

White Lead.—Nothing distinctly new has come to the surface regarding competition between the National Lead Company producers and outside manufacturers. The latter adjust prices to suit circumstances, and with the cost of Pig Lead on a low level, are in a position to grant slight concessions without sacrificing profits. However, it does not appear that the combined corrodors find it necessary to reduce their prices to retain custom. The general report by local concerns is that their sales are fully up to the average for the season and satisfactory, all told. Jobbers are following practically the same line of action that has been common with them for some considerable time past, and deal out small parcels at prices remarkably close to those that are paid for large lots.

Red Lead and Litharge.—Low grade product used by glass manufacturers is meeting with very good sale, and there is a full average movement in the finer grades employed in the Paint trade. Prices for all varieties remain as before, and the general market shows fairly firm tone.

Orange Mineral.—Foreign brands command former prices, and the market for domestic remains very steady. Sales are of about the usual character, and the volume of business is good.

Zincs.—American Oxide continues to be moved out in quite liberal quantity in delivery on back orders, and new contracts for most grades keep fully up to the former volume. There are no indications of any concessions from the old line of prices, and manufacturers evidently work harmoniously, despite the increase that has taken place of late in the output of some factories. Foreign brands are without change in price, but sales are only fair, and the demand is at present chiefly for moderate quantities.

Colors.—No important changes in prices for bulk goods used by grinders have taken place, and, as a whole, the market for the same shows very steady tone. Sales are of quite good volume. Dry Colors for painters' use have been selling very fairly, as have also various lines of Oil Colors and ready-mixed Paints, and prices for high-grade product are well maintained.

Miscellaneous.—There is nothing new to report on the market for Chalk, Whiting or Putty. Barytes and Clays generally are likewise bare of new feature. Business in the several lines is of about usual volume.

Oils and Turpentine.

Except in prime Lard Oil, for which pressers have advanced their prices con-

siderably, there have been very few and only unimportant changes during the past week. Outside of the above there is, in fact, no distinctly new feature to note. All along the line the undercurrent is one of firmness, with favorable indications for higher prices on those lines of goods that have remained almost stationary during the past month or six weeks. There is no speculative movement at present nor remarkably extensive buying on the part of large consumers or by exporters. Still, the volume of business is apparently sufficient to afford quite general satisfaction, and the outlook is considered good for a more active business in the immediate future.

Linseed Oil.—While not of unusual character in any respect, the movement in this commodity appears to be of very good volume, and there is reason to believe that buyers have become educated up to the higher level of price that was established immediately after the success of efforts to harmonize "trust" and "anti-trust" interests. In any event, local manufacturers assert that business is now of full average volume for the season, while sellers of Western brands make substantially the same statement. In some quarters the opinion is expressed that prices will be further advanced should the cost of seed go higher, but the surface appearances are that manufacturers are unlikely to quote higher until present stocks bought at low prices by large consumers and jobbers are worked down.

Lard Oil.—City pressers have advanced their price for prime Lard Oil to 67¢, and Western and other out-of-town brands are relatively as high. This rise is due to the high cost of raw material and comparatively light offering of the same for prompt delivery. There is a possibility that orders for November delivery would be taken at lower prices than those asked for spot goods, since Lard may be secured about 1¢ @ 1½¢ cheaper for November than for October delivery. Pressers are backward about offering for future, however, and the probability that the Lard "deal" will not be carried beyond October restrains buyers from placing orders. At the present time there is only a routine business passing.

Cotton-Seed Oils.—Thus far there is little buying in a large way except by Western consumers, who are taking quite their usual quantity of new Crude in bulk for direct shipment from the producing points. Exporters rarely purchase more than a few hundred barrels at a time, and other home consumers than those referred to purchase in a conservative way. Jobbers seem also to be disinclined to buy on a large scale, and speculative interest is tamer than usual at this season of the year. However, the business passing is at full former prices, and the opinion still obtains that natural conditions will bring about higher figures in the near future. Spot sales have been chiefly at 27½¢ @ 28¢ for prime crude, 30¢ @ 30½¢ for prime Summer Yellow, 31½¢ for prime Summer White and 31½¢ @ 32¢ for Butter Grade Yellow.

Fish Oils.—No further change has taken place in prices of crude Menhaden, and current quotations on crude Sperm and Whale are nearly similar to those that ruled a week ago. Nothing in the way of distinctly new feature has transpired. Most lines of manufactured products are moving out very nicely in ordinary jobbing quantities, and prices remain very firm throughout.

Spirits Turpentine.—Prices have improved to the extent of 1¢ @ 1½¢ gallon, owing chiefly to moderate arrivals, fair average demand and consequent reduction in stocks in receivers' hands. Sales were made at up to 29½¢ for regular and 30¢ for machine barrels.

The Favorite Reversible Ratchet Wrench.

Greene, Tweed & Co., 83 Chambers street, New York, are offering this wrench, as illustrated herewith. The head, Fig. 2,



Fig. 1.—The Favorite Reversible Ratchet Wrench.

is made to fit a square nut at one end and a hexagon nut at the other, the opening extending through the head for the bolt to pass through. This is referred to as making it valuable, because the nut being

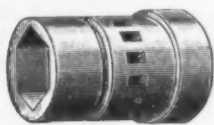


Fig. 2.—Head for Favorite Wrench.

encompassed on all sides has no chance to turn or slip, thus avoiding all danger of defacing the nut. A reverse motion of the wrench is instantaneously obtained by turning the pawl, near the head, from



Fig. 3.—Sockets for Favorite Wrench.

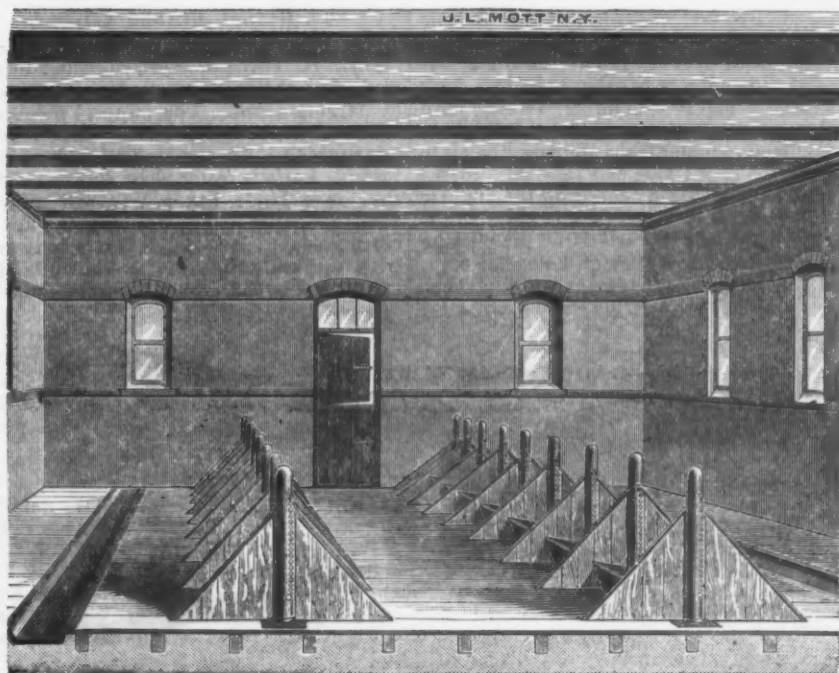
right to left, or *vice versa*. It is stated that after placing the wrench in position for use its motion is continuous until the nut is removed or seated. The wrenches are

sockets, as shown in Fig. 3. Eight of these sockets fit square nuts and seven fit hexagon nuts. In addition to the sockets is an extensive socket, 8 inches long, that will fit the wrench head and all the other sockets. The other sizes of wrenches are larger, taking larger nuts, and designed

for heavier work, having handles up to 28 inches in length. The manufacturers are also prepared to furnish a drill attachment, which is inserted by removing the head, thus making a reversible ratchet drill stock almost instantly. In use the wrench gives 10 to 13 grips in each revolution, making it available for use in contracted places. The tool is designed for tightening or removing nuts on track bolts, machinery, &c., to accomplish the result with little effort and a saving of time.

Cowhouse Fittings.

In a new catalogue of stable, cattle and piggery fittings recently issued by the J. L. Mott Iron Works, 84-90 Beekman street, New York, is found a varied assortment of cowhouse fittings and interiors, among them the design (copyrighted) here illustrated. These features are alluded to by the manufacturers as new, and as indicating a step forward, this trade, they say, not having been previously provided for in this country. Two lines of stalls are shown, with feeding passage in center and cast-iron gutter for droppings. The posts, to which are attached tying chains, are of cast iron, and should be placed about 3 feet 6 inches apart. From the edge of the feeding trough to the gutter there should be at least 4 feet 6 inches of floor, while the partition, for which cap and bottom rail of cast iron are provided,



Cowhouse Interior.

made in four sizes, with heads and sockets to fit nuts from $\frac{1}{4}$ inch to $2\frac{1}{4}$ inch. The wrench No. 0, as shown in Fig. 1, has a handle 15 inches long, one head, and 15

should be of 2-inch wood, running back not less than 2 feet. This plan admits of a suitable passage between the lines of stalls, which will enable those charged

with that duty to conveniently supply each manger with fodder. When a large herd is to be cared for rails could be laid and the material placed in a feeding wagon, to be dealt out in passing. This system is referred to as adapted for extensive stables, where convenience for working, cleanliness, ventilation and good accommodation must be amply provided for.

The Fire King Gas Heater.

A. Weiskittel & Son, Baltimore, Md., have just brought out a very attractive line of Fire King gas heating stoves possessing features of novelty. The ornamentation is rendered effective by the use of a large polished nickel front, inlaid



Fire King Gas Heater.

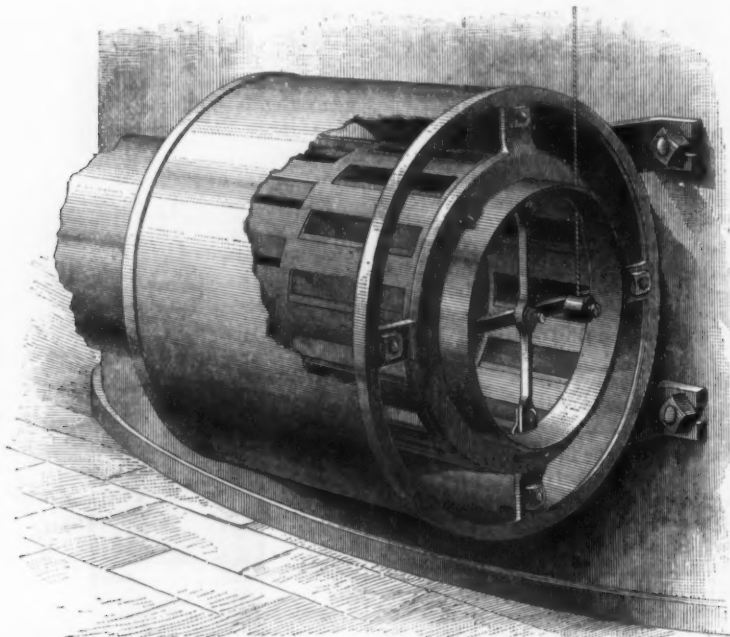
with diamond cut jewels of various colors, so arranged that the rays of light from the burners shine through them, producing very pleasant effects. The reflector is made of bright, corrugated copper and the fender in front is brass plated. Russia iron is used for the body. The stove also has large nickel rails, and is ornamented with a nickel urn of neat design. The polished brass cock, with pilot light, employed in connection with this line is claimed to be a great improvement over the old style. It is stated that with this device there can be no escape of unconsumed gas, as the pilot light is always lit before the burner is turned on and swung into the stove directly over the burner. The latter is then turned on and all gas is consumed. The device also greatly facilitates the lighting of the burner and prevents the explosion which is apt to occur in gas heaters where the gas fills the stove before the match is applied. Three sizes of the Fire King are made—No. 101, which is $6\frac{1}{2}$ inches in diameter, consuming 10 feet of gas per hour; No. 102, which is $8\frac{1}{2}$ inches in diameter, consuming 15 feet per hour, and No. 103, which is $10\frac{1}{2}$ inches in diameter, consuming 18 feet of gas per hour at a $\frac{1}{2}$ pressure. One size is illustrated herewith.

The Howard Thermostat.

A heat regulator possessing many features of novelty has just been brought to the attention of the trade by the Howard Thermostat Company, 529 South Clinton street, Syracuse, N. Y. It is referred to by the manufacturers as being of such construction that it can be readily applied to any furnace, boiler, stove or other heating apparatus, and does not depend for its power upon electricity, springs,

such construction as to render it very sensitive to changes in temperature. On the front of the plate and near the bottom is a small index, which is used to set the thermostat to the desired temperature, the index connecting with a bell crank on the rear of the plate. Attached to this bell crank is a braided silk cord, which extends down the partition to a point just below the floor, where it passes over frictionless pulleys to the cylinder dampers. The construction of the thermostatic plaque is such that when expan-

As long as the temperature of the room remains at the degree required the plaque occupies its normal position. From the above it will be seen the regulator is entirely automatic in its action, and requires no attention after the apparatus has been once properly set to give the temperature desired.



The Howard Thermostat.

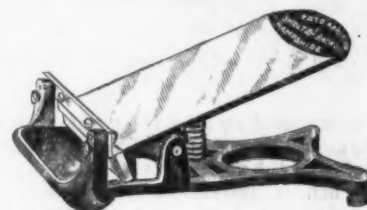
clock work, weights, water or compressed air. It is simple in its construction, very durable and has nothing to get out of order. It is known as the Howard Thermostat, and is illustrated in the accompanying cut by means of a broken view showing the interior construction. From an inspection of the engraving it will be seen that the device consists of two cylinders suspended in an outer casing and slotted at intervals in their circumference. These cylinder dampers, as they are designated by the manufacturers, are made of sheet brass and measure $8\frac{1}{2}$ inches in length and $10\frac{1}{2}$ inches in diameter. A close examination of the engraving will show a partition which separates the cylinder into two parts, one side being intended for the draft while the other serves as the check. At each end of the cylinder is an opening 6 inches in diameter. One end is connected by a pipe running to the ash pit section of the furnace or boiler in connection with which the thermostat is employed, while the other end connects with the smoke pipe at any convenient point. One of the cylinders or dampers, as they are called, is fixed, while the other is pivoted in such a way as to be easily rotated. Both cylinders are slotted, and the openings are so disposed that when in certain positions those on one side of the dividing partition are open, while those on the other side are closed. In the illustration the slots in the cylinder nearest the observer are nearly open, while those on the other side of the partition and to the left are nearly closed.

The thermostatic plaque, which is placed on the wall of the living room, or of any apartment upon the floor above the heating apparatus, is 11 inches long and 9 inches wide. The front of it is made of rubber, with a backing of metal, and is of

such construction as to render it very sensitive to changes in temperature. If a certain temperature is desired in a room the indicator is set at the proper point, and the arrangement of parts is such that the draft or check will be opened or shut as required without further attention. If the temperature of the room rises above that indicated by the index the thermostatic plaque curves toward the wall, allowing the cord to slacken, and as the check side of the damper is heavier than the draft side, the movable cylinder revolves until the openings in it register with those in the fixed cylinder, thus allowing the air to enter the check side and thus pass to the smoke pipe, thereby checking the fire. On the other hand, if the temperature of the room falls below that desired the plaque curves from the wall, tightening the cord, which closes the openings on the check

The Sholtz and Backus Envelope Opener.

The Warner Lock Company, Manhattan Building, Chicago, and Hampshire, Ill., are introducing this article, as shown in the accompanying cut. The opener consists of a pivoted plate, having a steel cutting edge, supported by a spiral spring. The envelope to be cut is slid down on the top of the plate, and a pressure of the hand then forces the lower end of the plate up, which brings the envelope in contact with the cutting bar, thus removing a very thin slice from the edge of the envelope. A gauge at the cutting bar prevents the envelope from sliding any further forward than is just necessary to effect the purpose desired. The operation of the machine is referred to as exceedingly simple, and so



The Sholtz and Backus Envelope Opener.

rapid that envelopes can be opened as fast as it is possible to move the hand. The particles of paper cut from the ends of the envelopes are caught in a little cup just outside of the cutter, so that they do not fall on the floor or table and cause a litter. The plate on which the hand rests is nickel plated and the remainder of the frame is japanned. The point is made that it forms not only a convenient desk tool, but is also attractive in appearance.

The Dinkel Orange Clipper.

Geo. H. Fernald, Sanford, Fla., is introducing this orange clipper, for which he is sole agent. The clipper measures $7\frac{1}{2}$ inches over all, with blades nearly $\frac{1}{2}$ inch thick. To the upper blade an adjustable knife is fastened by screws, while the lower blade has a V-shaped groove along its entire length, forming the lower cutting edge. It is stated that when used with the knife side up, as shown in the cut, it holds the orange or limb, while if



The Dinkel Orange Clipper.

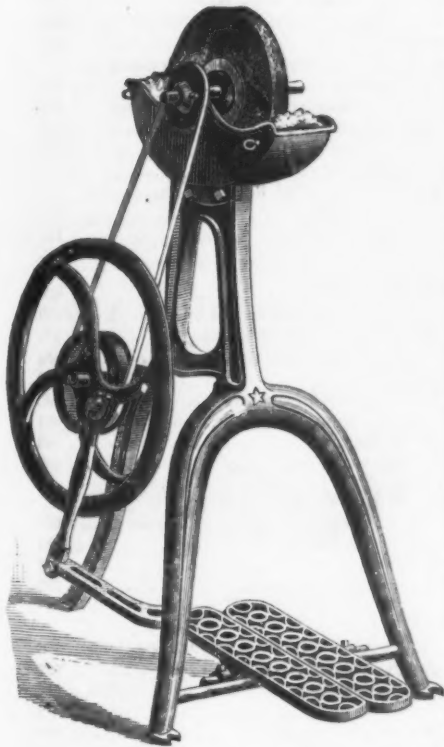
side and opens those on the draft side, allowing the air to pass through these openings to the pipe, and thence to the ash pit section, supplying combustion.

used with the knife side down the orange is clipped close, leaving no stem, or crushed stem, to injure the fruit by decay in shipping. Knives will be supplied

separate from the clipper if desired, but it is stated that they are durable and that one will last an entire season. The clipper is particularly designed for the Florida and California fruit trade.

Family Grindstone No. 2.

Millers Falls Company, 93 Reade street, New York and Millers Falls, Mass., are introducing this improved form of grindstone, as illustrated herewith. The frame is of iron and is run with a treadle. The



Family Grindstone No. 2.

stone runs in an iron water container, the latter being supplied with a sponge on each end secured in place by wire rods, to keep the water from flying from the stone. An emery wheel is attached to the grindstone shaft, not shown in the cut, and runs outside the trough.

The No. 2 stone is designed to take the place with the trade of the wooden frame stone which has been made by this company for the past ten years, and is listed 50 cents higher than the wooden machine.

U Single and Double Trees.

B. F. Avery & Sons, Louisville, Ky., are offering this form of tree, as illustrated herewith. These are made of steel, pro-



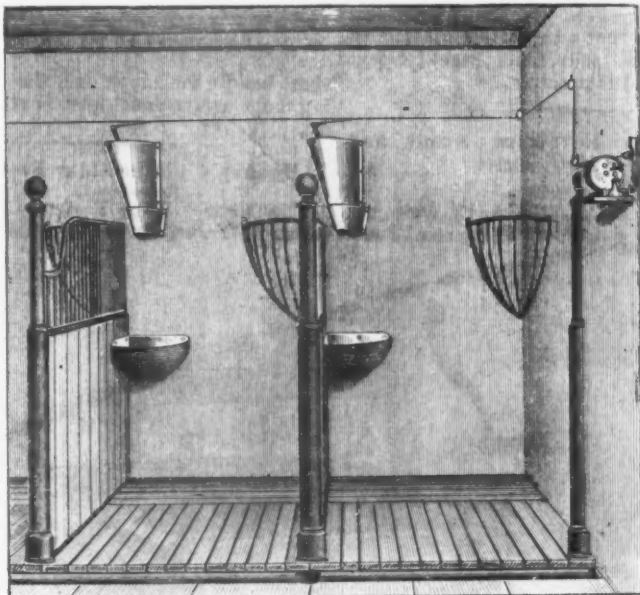
U Single and Double Trees.

vided with malleable hooks and center eye. The hooks are so arranged, it is claimed, that when trace chains are once hooked it is impossible for them to become unfastened. The point is made that they are proof against shrinkage, so that there is no delay or annoyance by the loss of clips or hooks. The manufacturers claim that they are as light as wood trees; that they are more serviceable, and that they are durable, and handy. They are

made in seven sizes, and are designed for plowing, teaming, street-car service and general use.

American Automatic Stock Feeder.

Gush & Potts, 97 Chambers street, New York, have recently introduced a device for automatically feeding stock, as here illustrated, which is referred to as simple in construction, with little to get out of order. The feeder is made of stout gal-



Automatic Stock Feeder.

vanized iron, heavily wired, being 18 inches high and 12 inches across the top, tapering to about 6 inches at the bottom, which is controlled by a sheet-iron trap door attached to an iron lever passing up the back of the feeder between the wall and a wooden back, which is a part of the article. In addition to the feeder, an oval hood, similarly constructed, of the same materials, is placed at the bottom as a guard to prevent the animal from interfering with the sheet-iron trap. At the top of the lever a short wire connects with a main wire, operating all the feeders in that section, and joined to an alarm clock constructed for this purpose. The feeders having been supplied with grain at the convenience of the keeper, the clock is set for such time as it is desired the horses should be fed, when by the action of the clock the tension on the main wire is removed, the trap door drops out of the way and the grain passes into the manger. There is no limit to the number to be fed, but the feeders are put up in sections of 25 or less to each clock. If desired, an owner could have a wooden or metal

tions, caused by the uneasiness of horses hearing others being fed, and the saving of time to those compelled to make early deliveries. They are especially suited to express companies, car stables, breweries, bakers, milkmen, liveries, &c.

Combined Heater and Shade for Gas.

F. Busch, 251 Bowery, New York, is offering this article, as illustrated herewith. The heater is placed on the gas jet and the

cup containing the liquid to be heated is put on top of the heater. The device is designed for use at night, where a night light is required in a sleeping apartment,



Combined Heater and Shade for Gas.

to keep the rays of light from the eyes of the occupants of the room.

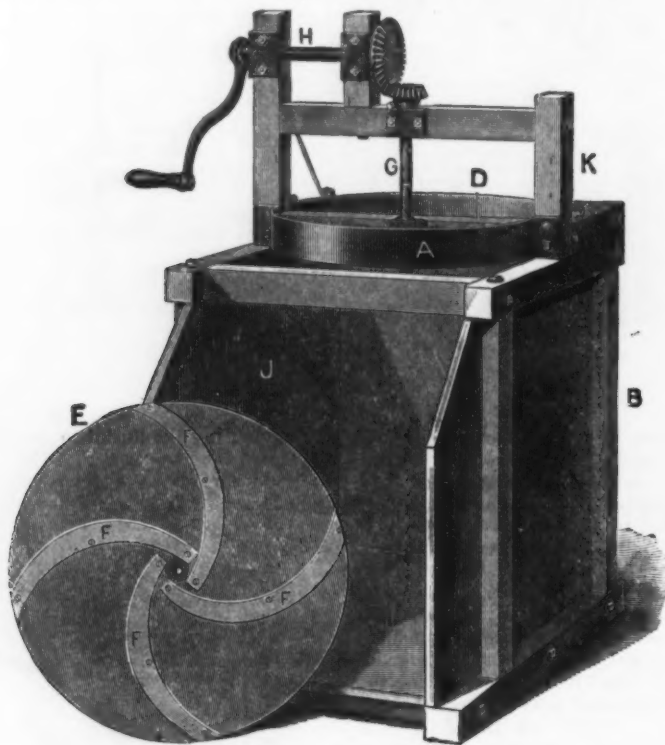
Bill Nye Brad Box.

Grand Crossing Tack Company, Grand Crossing, Ill., are introducing boxes of assorted wire brads, especially adapted for retailing at 5 cents a paper. The dove-tailed box containing the brads measures outside 16½ inches long, 8½ inches wide and 6 inches deep. This box is designed as a drawer to fit the retailer's shelving, the front being covered with paper or painted by the merchant to correspond

with surroundings, after the cover is removed. The box contains 168 papers of wire brads, costing from the jobber \$4 plus the freight, and brings the merchant in \$8.40 when sold at 5 cents a paper. The point is made by the manufacturers that dealers have been carrying two or three gauges of each length brad; now the manufacturers settle that point by giving, in their estimation, the best gauge for each length. The customer thus gets, for instance, a 1-inch wire brad, as he used to get a 1-inch patent cut brad, the dealer being relieved of the trouble of showing two or three gauges of one-length brad. This plan carries out the idea that dealers nowadays do not want to spend time in making 5-cent sales, but want 5-cent goods that sell themselves.

The Cyclone Revolving Kraut and Vegetable Cutter.

J. H. Day & Co., Cincinnati, Ohio, are offering this cutter, as illustrated here-



The Cyclone Revolving Kraut and Vegetable Cutter.

with. The cutting head or disk is provided with four circular-shaped knives so arranged that they can be easily taken out and replaced when sharpening is necessary. The advantage of the circular-shaped knife over a straight one, it is stated, is that it makes a clean draw cut through the vegetables, thus avoiding all chopping or breaking. Above the cutting disk is a hood, which is not shown in the cut; this hood receives the cabbage for cutting and holds it in place until it is reduced. The cuttings fall into the large box below the knives, from which they can be easily removed. The manufacturers claim that it requires much less power to operate one of these machines on account of the arrangement of the cutter head; that two large boys can easily cut 300 heads of cabbage an hour, and if steam power is used the machine will cut all one man can feed. The point is made that the kraut thus cut is long and fine, thus increasing its desirability.

Improved Grass Hook.

G. & M. Nolin, Skowhegan, Maine, are offering an improved grass hook, as shown in the accompanying cut. A steel socket or ferrule is substituted in place of the

malleable shank heretofore used. This change, it is claimed, decreases the weight of the tool, makes it stronger and allows the operator to easily change the ordinary



Improved Grass Hook.

short handle for a long one, the latter being more convenient when cutting corn, &c.

Mooney's Clothes-Line Fastener.

The Mooney Rope Fastener Company, Olean, N. Y., are introducing this fastener,



Mooney's Clothes-Line Fastener.

ropes or ropes when subjected to a strain, without recourse to any of the various

forms of knots commonly used for the purpose. It is referred to by the manufacturers as simple and reliable, and is recommended by them particularly as a clothes-line fastener.

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OCTOBER 5, 1892.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Butts—

| | |
|----------------------------|-----------|
| Brass— | |
| Wrought Brass..... | 80@80&10% |
| Cast Brass, Tiebout's..... | 50% |
| Cast Brass, East..... | 33&4&10% |

Cast Iron—

| | |
|------------------------------------|------------|
| Fast Joint, Narrow..... | 50&10&5&60 |
| Fast Joint, Broad..... | 50&10&60 |
| Loose Joint..... | |
| Loose Joint, Japanned..... | |
| Loose Joint, Jap. with Acorns..... | |
| Parliament Butts..... | .75&.75 |
| Mayer's Hinges..... | &5 |
| Loose Pin, Acorns..... | |
| Loose Pin..... | |

Loose Pin, Acorns, Japanned,
Plated Tops

Wrought Steel—
Fast Joint, Narrow.....

| | |
|------------------------------|--------|
| Fast Joint, 1/2" Narrow..... | |
| Fast Joint, Broad..... | |
| Loose Joint, Broad..... | .75@75 |

| | |
|----------------------------------|-----|
| Table Butts, Back Flaps, &c..... | 25 |
| Inside Blind, Regular..... | |
| Inside Blind, Light..... | |
| Loose Pin..... | |
| Bronzed Wrought Butts. | 50% |

Calipers—See *Compasses*.
Calks, Tee—

| | |
|--------------------------------|-------|
| Gauley, One Prong, Blunt..... | 51c@6 |
| Burke's One Prong, Blunt..... | 51c@6 |
| Burke's, Two Prong, Blunt..... | 74c@9 |
| Burke's, One Prong, Sharp..... | 64c@9 |

Can Openers—See **Openers**,
Can.

Caps—
Percussion—

| | |
|---|---------|
| Hicks & Goldmark's and Union Metal Cartridge Co. | \$ 1000 |
| F. L. Waterproof, 1-10's..... | 35c@37c |
| E. B. Trimmed Edge, 1-10's..... | 47c@50c |
| E. B. Grmd. Edge, Cent. Fir, 1-10's..... | 47c@50c |
| Musket, Waterproof, 1-10's..... | 50c@55c |
| G. D..... | 27c@30c |
| S. B. Genuine Imported..... | 45c |

ley's E. B.....56@58¢
ley's D Waterproof, Central Fire..\$1.00

| | |
|--|----|
| Primers— | |
| Berdan Primers, \$1.00..... | 2% |
| B. L. Caps (for Sturtevant Shells) \$1.00..... | 2% |
| All other Primers, \$1.20..... | 2% |
| Cards— | |

Watson's Cotton, Wool, Horse and
File. Sat. January 28, 1891. 25¢

Carpet Stretchers—
See *Stretchers, Carpet.*

Carpet Sweepers—

See Sweepers, Carpet.

Cartridges—
 Rim Fire Cartridges.....50¢&5¢2¢
 Rim Fire Military.....15¢&2¢
 Cent. Fire, Pistol and Rifle.....25¢&5¢2¢
 Cent. Fire, Military and Sporting.....15¢&5¢2¢
 Blank Cartridges, except 22 and 32 cal.,
 additional 10% on above discounts.

| | |
|--|----|
| Blank Cartridges, 22 cal., \$1.75..... | 2% |
| Blank Cartridges, 32 cal., \$3.50..... | 2% |

| | |
|---|----------------------|
| Primed Shells and Bullets..... | 15¢5¢2½ |
| B. B. Caps, Round Ball, \$1.75..... | 2½ |
| B. B. Caps, Con. Ball, Swgd., \$2.00..... | 2½ |
| Casters— | |
| Bed..... | Brass.....55¢55¢10% |
| Plate..... | Others.....60¢60¢10% |
| Shallow Socket..... | |
| Deep Socket..... | 40¢10% |
| Yale Casters, low list..... | 45% |
| Yale Casters..... | 70% |

| | | |
|-------------------------------|-------|-----|
| Martin's Patent (Phoenix).... | 45¢10 | 50% |
| Nixon's Anti-friction..... | | 70% |

| | |
|-------------------------------|--------|
| Payson's Anti-friction..... | 60% |
| Payson's Truck..... | 60% |
| Giant Truck Casters..... | 30% |
| Stationary Truck Casters..... | 50&10% |
| Socket Truck Casters..... | 50% |
| Winner's Common Sense..... | 50% |

winner's Hercules.....50%

Winner's Hercules.....50¢
Cattle Leaders—
 See *Leaders, Cattle.*
Cement—
 Victor Elastic.....5 ¢ pails 7 ¢ 5¢
Chain—
 Trace, Wagon and Fancy Chains.

List revised April 21, 1890...00@60&10\$
merican Coll, in cask lots,
18 14 8-18 16 7-18 16 16 16

List revised April 21, 1890...60¢@60¢&10%
American Coll, in cash lots,
3-16 1/2 5-16 3/4 7-16 1/2 9-16 1/2 11-16 1/2 13-16 1/2
\$7.00 5.30 4.45 3.80 3.05 3.50 3.40 3.25
Less than cash lots, add 10%
German Coll, list July 12, 1892...60¢@60¢&5%
German Halter Chain, list July 12, 1892...
60¢@60¢&5%
Covert Halter.....60¢@25%

| | |
|-------------------------|----------|
| Revert Traces..... | 50@2% |
| Revert Heel Chain..... | 50@2% |
| Reida Halter Chain..... | 60@60&5% |

| | |
|----------------------------|----------|
| Covert Traces..... | 50¢25 |
| Covert Heel Chain..... | 50¢25 |
| Oneida Halter Chain..... | 60¢60¢25 |
| Galvanized Pump Chain..... | 5¢6¢8¢ |
| Jack Chain, Iron..... | 80¢10¢ |
| Jack Chain, Brass..... | 80¢ |

Chalk—

ed. case lots. 7 gr 67¢; small lots 77

White, case lots. ½ gr 50¢; small lots 55¢
 Red, case lots.... ½ gr 67¢; small lots 77¢
 Blue, case lots.... ½ gr 75¢; small lots 85¢
 See also Crayons

Chalk Lines—See Lines.**Chisels—****Socket Framing and Firmer**

| | | |
|------------------|-------|------------|
| New Haven | ..... | 75¢@75¢10¢ |
| Wetherby | ..... | 75¢@75¢10¢ |
| Mix. | ..... | 75¢@75¢10¢ |
| Ohio Tool Co. | ..... | 75¢@75¢10¢ |
| Douglas | ..... | 75¢@75¢10¢ |
| Buck Bros. | ..... | 75¢@75¢10¢ |
| Merrill | ..... | 75¢@75¢10¢ |
| L. & I. J. White | ..... | 75¢@75¢10¢ |

Tanged and Miscellaneous.

| | | |
|-------------------|-------|------------|
| Tanged Firmers | | 40¢@10¢50¢ |
| Butchers | ..... | 40¢@10¢50¢ |
| Spear & Jackson's | ..... | 40¢@10¢50¢ |
| Buck Bros. | ..... | 40¢@10¢50¢ |
| Cold Chisels | ..... | 15¢@10¢ |

Chucks—

| | | |
|--------------------------|-------|-------------------|
| Beach Pat. | ..... | 20¢ |
| Morse's Adjustable, each | ..... | \$7.00, 30¢@20¢5¢ |
| Danbury | ..... | 30¢@20¢5¢ |
| Syracuse, Balz Pat. | ..... | 25¢ |
| Graham Patent | ..... | 33¢@5¢ |
| Skinner's Patent Chucks | ..... | 33¢@5¢ |
| Combination Lathe Chucks | ..... | 33¢@5¢ |
| Universal Lathe Chucks | ..... | 40¢ |
| Independent Lathe Chucks | ..... | 40¢ |
| Drill Chucks | ..... | 15¢ |
| Union Mfg. Co. | ..... | \$8.50, 25¢ |
| Victor | ..... | 40¢ |
| Combination | ..... | 40¢ |
| Universal | ..... | 40¢ |
| Independent | ..... | 40¢ |

Churns—

| | | |
|-----------------------------------|-------|--|
| Tiffin Union, each, 5 gal. | ..... | \$3.25; 7 gal., \$3.75; 10 gal., \$4.25. |
| McDonald Star Barrel Churns, each | ..... | 6 gal., \$2.00; 10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25. |

Clamps—

| | | |
|-------------------------------------|-------|------------|
| R. I. Tool Co.'s Wrought Iron | ..... | 25¢ |
| Adjustable, Cincinnati | ..... | 15¢@10¢ |
| Adjustable, Hammers | ..... | 15¢ |
| Adjustable, Steam's | ..... | 30¢@20¢10¢ |
| Steam's Adjustable Cabinet and Cor- | ..... | ner |
| Cabinet, Sargent's | ..... | 60¢@10¢ |
| Carriage Makers', Sargent's | ..... | 70¢@10¢ |
| Carriage Makers', P. S. & W. Co. | ..... | 40¢@10¢ |
| Eberhard Mfg. Co. | ..... | 40¢@10¢ |
| Warner's | ..... | 40¢@10¢ |
| Saw Clamps, see Vices, Saw Filers | ..... | 25¢@10¢ |
| Carpenter's, Cincinnati | ..... | 25¢@10¢ |

Cleavers, Butchers'—

| | | |
|---------------------------|-------|----------------|
| Bradley's | ..... | 25¢@30¢ |
| L. & I. J. White | ..... | 20¢@5¢ |
| Beatty's | ..... | 40¢@40¢5¢ |
| New Haven Edge Tool Co.'s | ..... | 40¢ |
| P. S. & W. | ..... | 33¢@5¢@33¢@40¢ |
| Foster Bros. | ..... | 30¢ |
| Schulte, Lohoff & Co. | ..... | 40¢@40¢5¢ |

Clips—

| | | |
|-----------------------------------|-------|--------|
| Norway, Axle, 1/4 & 5-16 | ..... | 55¢@5¢ |
| 2d grade Norway, Axle, 1/4 & 5-16 | ..... | 65¢@5¢ |
| Superior Axle Clips | ..... | 60¢@5¢ |
| Norway Spring Bar Clips, 5-16 | ..... | 60¢@5¢ |
| Wrought Iron Felloe Clips | ..... | 5¢ |
| Steel Felloe Clips | ..... | 5¢ |
| Baker Axle Clips | ..... | 25¢ |

Cloth and Netting, Wire

—See Wire, &c.

Cockeyes**Cocks, Brass—**

| | | |
|---------------|-------|--------|
| Hardware list | | 60¢@2¢ |
|---------------|-------|--------|

Coffee Mills—See Mills, Coffee.**Collars, Dog—**

| | | |
|--------------------------------------|-------|-------------|
| Chapman Mfg. Company | ..... | 50¢@10¢@40¢ |
| Medford Fancy Goods Co. | ..... | 40¢@10¢@50¢ |
| Embossed, Gift, Pope & Steven's list | ..... | 30¢@10¢ |
| Leather, Pope & Steven's list | ..... | 40¢ |
| Brass, Pope & Steven's list | ..... | 40¢ |

Combs, Curry—

| | | |
|-------------------------|-------|-----------------|
| Fitch's | ..... | 50¢@10¢@50¢@10¢ |
| Rubber, per doz. | ..... | \$10.00 |
| American Curry Comb Co. | ..... | 33¢@40¢ |

Compasses, Dividers, &c.

| | | |
|---|-------|---------|
| Compasses, Calipers, Dividers, 70¢@70¢10¢ | | |
| Bemis & Call Co.'s | ..... | 60¢@5¢ |
| Dividers | ..... | 60¢@5¢ |
| Compasses and Calipers | ..... | 50¢@5¢ |
| Wing and Inside or Outside | ..... | 60¢@5¢ |
| Double | ..... | 60¢ |
| Call's Patent Inside | ..... | 30¢ |
| Excelsior | ..... | 30¢ |
| J. Stevens & Co.'s | ..... | 25¢@10¢ |
| Starrett's | ..... | 25¢@10¢ |
| Spring Calipers and Dividers | ..... | 25¢@10¢ |
| Lock Calipers and Dividers | ..... | 25¢ |
| Combination Dividers | ..... | 25¢ |

Coopers' Tools—

—See Tools, Coopers'.

Cord—

| | | |
|-------------------------------------|-------|-----------|
| Common | ..... | 10¢@11¢ |
| Patent, good quality | ..... | 12¢@12¢ |
| White Cotton Braided, fair | ..... | 24¢@25¢ |
| Common Russia Sash | ..... | 12¢@13¢ |
| Patent Russia Sash | ..... | 14¢ |
| Cable Laid Italian Sash | ..... | 21¢@22¢ |
| India Cable Laid Sash | ..... | 12¢ |
| Silver Lake | ..... | 25¢ |
| A quality, White, 50¢ | ..... | 25¢ |
| A quality, Drab, 50¢ | ..... | 25¢ |
| B quality, White, 50¢ | ..... | 10¢ |
| B quality, Drab, 50¢ | ..... | 10¢ |
| Sylvan Spring, Extra Braided, White | ..... | 34¢ |
| Sylvan Spring, Extra Braided, Drab | ..... | 39¢ |
| Semper Idem, Braided, White | ..... | 30¢ |
| Egyptian, India Hemp, Braided | ..... | 20¢ |
| Massachusetts, White | ..... | 30¢ |
| Samson | ..... | 30¢@30¢5¢ |
| Braided, White Cotton, 50¢ | ..... | 30¢@30¢5¢ |
| Braided, Drab Cotton, 50¢ | ..... | 30¢@30¢5¢ |
| Braided, Italian Hemp, 50¢ | ..... | 30¢@30¢5¢ |
| Braided, Linen, 50¢ | ..... | 30¢@30¢5¢ |
| Tate's Cotton Braided, White, 50¢ | ..... | 28¢@10¢ |
| Ossawaun Mills | ..... | 30¢ |
| Braided, Giant, White, 50¢ | ..... | 30¢ |
| Braided, Giant, Drab and Fancy, 50¢ | ..... | 30¢ |
| Braided, Crown, White, 50¢ | ..... | 10¢ |
| Braided, Crown, Drab and Fancy, 50¢ | ..... | 10¢ |
| Braided, Crown, White, 50¢ | ..... | 50¢ |
| Braided, Crown, Drab and Fancy, 50¢ | ..... | 50¢ |

Wire Picture—

Braided or Twisted.....80¢@80¢15¢

Corkscrews—See Screws, Cork.**Corn Knives and Cutters**

—See Knives, Corn.

Crackers, Nut—

| | | |
|---------------------------|-------|------|
| Table (H. & B. Mfg. Co.) | ..... | 40¢ |
| Blake's Pattern, 1/2 doz. | ..... | 2.00 |
| Turner & Seymour Mfg. Co. | ..... | 50¢ |
| Acme, 1/2 gross | ..... | \$30 |
| Japanned | ..... | 70¢ |
| Nickel Plated | ..... | 10¢ |

Cradles—

| | | |
|-------|-------|----------------------|
| Grain | | 50¢@5¢@2¢@50¢@10¢@2¢ |
|-------|-------|----------------------|

Crays—

| | | |
|---------------------------------------|-------|-------------------|
| White Crays, 1/2 gross | ..... | 10¢ |
| D. M. Stewart Mfg. Co., Metal Work- | ..... | ers |
| 1/2 gross, \$2.50 | ..... | 25¢ |
| D. M. Stewart Mfg. Co., Helling Mill, | ..... | 1/2 gross, \$2.50 |
| See also Chalk. | ..... |  |

Crow Bars—See Bars, Crow.**Curry Combs—**

—See Combs, Curry.

Curtain Pins—

—See Pins, Curtain.

Cutters—

—See Meat—

| | | |
|----------------------|-------|---------------------------------|
| Dixon's, 1/2 doz. | ..... | 40¢@5¢ |
| Nos. | ..... | 1 2 3 4 5 6 |
| Each | ..... | \$14.00 \$17.00 \$19.00 \$20.00 |
| Woodruff's, 1/2 doz. | ..... | 40¢@5¢ |
| Nos. | ..... | 100 150 |
| Each | ..... | \$15.00 \$18.00 |

| | | |
|--------------------------|-------|-----------------------------|
| Hale's Pattern, 1/2 doz. | ..... | 70¢@10¢5¢ |
| Nos. | ..... | 1 2 3 4 5 6 |
| Each | ..... | \$27.00 \$33.00 \$45.00 |
| American | ..... | 30¢ |
| Nos. | ..... | 1 2 3 4 5 6 |
| Each | ..... | \$5 \$7 \$10 \$25 \$50 \$90 |

| | | |
|----------------------------|-------|------------------------------------|
| Enterprise | ..... | 30¢ |
| Nos. | ..... | 10 12 22 32 42 |
| Each | ..... | \$3 \$2.50 \$4 \$6 \$15 |
| Great American Meat Cutter | ..... | 30¢ |
| Nos. | ..... | 112 116 118 120 122 |
| Each | ..... | \$2.00 \$2.75 \$3.00 \$3.50 \$4.00 |

| | | |
|----------------------------|-------|-------------------------|
| Miles' Challenge, 1/2 doz. | ..... | 45¢@45¢10¢ |
| Nos. | ..... | 1 2 3 |
| Each | ..... | \$22.00 \$30.00 \$40.00 |
| Home No. 1, 1/2 doz. | ..... | \$25.00 |
| Draw Cut, each | ..... | 20¢@25¢ |
| Nos. | ..... | 5 6 8 12 |
| Each | ..... | \$50 \$75 \$80 \$225 |

| | | |
|---|-------|-------------|
| Beef Shavers (Enterprise) | ..... | 20¢@10¢@30¢ |
| Little Giant (P. S. & W. Co.) | ..... | 50¢ |
| Chadborn's Smoked Beef Cutter, 1/2 doz. | ..... | \$65.00 |

Tobacco

| | | |
|-------------------------------|-------|----------------------------|
| Champion | ..... | 20¢@10¢@30¢ |
| All Iron | ..... | 1/2 doz., \$4.25 |
| Nashua Lock & Co.'s, 1/2 doz. | ..... | \$18.00, 50¢@55¢ |
| Wilson's | ..... | 55¢ |
| Sargent's | ..... | 1/2 doz., \$24.00, 55¢@10¢ |
| Acme | ..... | 1/2 doz., \$20.00, 40¢ |

Washer—

| | | |
|--|-------|-------------------------------|
| Smith's Pat. | ..... | 1/2 doz., \$12.00, 20¢@10¢10¢ |
| Johnson's | ..... | 1/2 doz., \$11.00, 33¢@5¢ |
| Penny's, 1/2 doz., Pol. #14; Jap'd, #16, 55¢ | ..... |  |
| Appleton's | ..... | 1/2 doz., \$10.00, 60¢@10¢ |
| Bonney's | ..... | 30¢@10¢ |
| Cincinnati | ..... | 25¢@10¢ |

Dampers, &c.—

| | | |
|----------------------|-------|---------|
| Dampers, Buffalo | | 40¢@10¢ |
| Buffalo Damper Clips | ..... | 40¢@10¢ |
| Crown Damper | ..... | 40¢ |
| Excelsior | ..... | 40¢@10¢ |

Diggers, Post Hole, &c.—

| | | |
|-------------------------------------|-------|-------------------------|
| Samson Post Hole Digger, 1/2 doz. | ..... | \$36.00 |
| Fletcher Post Hole Augers, 1/2 doz. | ..... | \$36.00 |
| Eureka Diggers | ..... | 1/2 doz., \$12.50@14.00 |
| Leed's | ..... | 1/2 doz., \$8.00@10.00 |
| Vaughan's Post Hole Auger | ..... | 1/2 doz., \$13.00@14.00 |

| | | |
|-------------------------|-------|-------------------|
| Kohler's Little Giant | ..... | 1/2 doz., \$18.00 |
| Kohler's Hercules | ..... | 1/2 doz., \$15.00 |
| Kohler's New Champion | ..... | 1/2 doz., \$9.00 |
| Scheidler | ..... | 1/2 doz., \$18.00 |
| Ryan's Post Hole Digger | ..... | 1/2 doz., \$24.00 |
| Cronk's Post Bars | ..... | 1/2 doz., \$60.00 |

| | | |
|-------------------------|-------|-------------------|
| Gibb's Post Hole Digger | ..... | 50¢@5¢@10¢ |
| Imperial | ..... | 1/2 doz., \$15.00 |
| Shimer's Hollow Handle | ..... | 1/2 doz., \$24.00 |

Dividers—See Compasses.**Dog Collars—See Collars, Dog.****Door Springs—**

—See Springs, Door.

Drawers.

| | | |
|-----------------|-------|-----------|
| Money, 1/2 doz. | | \$18¢@30¢ |
|-----------------|-------|-----------|

Drawing Knives—

—See Knives, Drawing.

Drills and Drill Stocks—

| | | |
|---------------------------------|-------|------------------|
| Blacksmiths | ..... | each \$1.75 |
| Blacksmiths' Self-Feeding, each | ..... | \$7.50, 20¢ |
| Preast, P. S. & W. | ..... | 40¢@10¢ |
| Breast, Wilson's | ..... | 30¢@5¢ |
| Breast, Millers Falls | ..... | each \$3.00, 35¢ |
| Breast, Bartholomew's | ..... | each \$2.50 |
| Ratchet, Merrill's | ..... | 20¢@20¢5¢ |
| Ratchet, Ingalls's | ..... | 25¢ |
| Ratchet, Parker's | ..... | 30¢@20¢5¢ |
| Ratchet, Whitney's | ..... | 30¢@10¢ |
| Ratchet, Weston's | ..... | 20¢@25¢ |
| Ratchet, Moore's Triple Action | ..... | 25¢@30¢ |
| Ratchet, Curtis & Curtis | ..... | 30¢ |
| Whitney's Hand Drill, Plain | ..... | \$11.00 |
| Adjustable | ..... | \$12.00 |
| Wilson's Drill Stocks | ..... | 1/2 doz., \$1.75 |
| Automatic Boring Tool | ..... | \$1.75@1.85 |
| Chicopee Automatic Drill | ..... | 20¢@10¢ |

Twist Drills—

| | | |
|----------------------------|-------|-----------|
| Cleveland | ..... | 50¢@10¢5¢ |
| Diamond, W. & B. | ..... | 50¢@10¢5¢ |
| Graham's Pat. Groove Shank | ..... | 50¢@10¢5¢ |
| Morse | ..... | 50¢@10¢5¢ |
| New Process | ..... | 50¢@10¢5¢ |
| Standard | ..... | 50¢@10¢5¢ |
| Syracuse (Meta list) | ..... | 40¢ |

Drill Bits or Bit Stock

Drills—See Augers and Bits.

Drill Chucks—See Chucks.**Dripping Pans—**

—See Pans, Dripping.

Drivers, Screw—

| | | |
|---------------------------|-------|------------|
| Douglas Mfg. Co. | ..... | 20¢@20¢10¢ |
| Diston's | ..... | 50¢ |
| Buck Bros. | ..... | 30¢ |
| Stanley R. & L. Co.'s | ..... | 65¢@10¢ |
| No. 64, Varnished Handles | ..... | 70¢@10¢ |
| No. 86 | ..... | 70¢@10¢ |

| | | |
|---------------------|-------|------------|
| Sargent & Co.'s | ..... | 60¢@10¢10¢ |
| No. 1, Forged Blade | ..... | 60¢@10¢10¢ |
| Nos. 20, 40 and 60 | ..... | 60¢@10¢10¢ |
| P. S. & W. | ..... | 70¢ |
| Knapp & Cowles | ..... | 60¢@20¢70¢ |

| | | |
|-------------------------------|-------|---------------|
| No. 1 | ..... | 60¢@10¢70¢5¢ |
| No. 3 | ..... | 60¢@5¢@10¢10¢ |
| Nos. 1 and 60, Acme and Ideal | ..... | 50¢@5¢ |
| Stearns | ..... | 25¢@10¢5¢ |
| Gay & Parsons | ..... | 35¢ |
| Champion | ..... | 25¢@10¢ |

| | | |
|------------------------------|-------|------------------|
| Crawford's Adjustable | ..... | 30¢@33¢@5¢ |
| Ellrich's Socket and Ratchet | ..... | 25¢@25¢10¢ |
| Allard's Spigal, new list | ..... | 25¢ |
| Kolb's Common Sense | ..... | 1/2 doz., \$6.00 |

| | | |
|---------------------------|-------|---------------------|
| Syracuse Screw-Drive Bits | ..... | 30¢@20¢5¢ |
| Screw Driver Bits | ..... | 1/2 doz., 50¢@75¢ |
| Screw Driver Bits, Parr's | ..... | 1/2 gross, \$6.25 |
| Pray's Hol. H'dle Sets | ..... | No. 3, \$12.00, 45¢ |
| P. D. & Co.'s All Steel | ..... | 50¢ |
| Cincinnati | ..... | 25¢@10¢ |

| | | |
|------------------------------|-------|----------|
| Brace Screw Drivers | ..... | 25¢@10¢ |
| Buck Bros. Screw Driver Bits | ..... | 27¢@8¢5¢ |
| Goodell's Automatic | ..... | 50¢ |
| Mayhew's Black Handle | ..... | 30¢ |
| Mayhew's Monarch | ..... | 45¢@10¢ |

Egg Beaters—See Beaters, Egg.**Egg Poachers—**

—See Poachers, Egg.

Electric Bell Sets—

—See Bells, Electric.

Emery—No. 4 to No. 54 to Flour, CF.

| | | | | |
|-------------------|-------|---------|-------|------|
| 46 gr. | ..... | 150 gr. | ..... | FFF. |
| 1/2 doz. | ..... | 5¢ | ..... | 2¢ |
| 1/2 doz. | ..... | 5¢ | ..... | 2¢ |
| 1/2 doz. | ..... | 5¢ | ..... | 3¢ |
| 10-1/2 cans, 10 | ..... | 6¢ | ..... | 5¢ |
| 10-1/2 cans, less | ..... | 10¢ | ..... | 10¢ |

Enameled and Tinned Ware—See Ware, Hollow.**Escutcheon Pins—**

—See Pins, Escutcheon.

Halters—

| | |
|--|--|
| Cover's Rope, Jute, 60x10x10x25 | |
| Cover's Rope, 7-16 in. Jute, 70x25 | |
| Cover's Rope, 1/2 in. Hemp, 50x25 | |
| Cover's Adj. Rope Halters, 40x25 | |
| Cover's Hemp Horse and Cattle Tie, 50x25 | |
| Cover's Jute Horse Ties, 70x25 | |
| Cover's Jute Cattle Ties, 70x10x25 | |
| Cover's Adj. Web Halters, 35x25x25 | |
| E. Cover Mfg. Co.'s Halters, 39x25 | |
| E. Cover Mfg. Co.'s Horse and Cattle Ties, 39x25 | |

Hammers—**Handled Hammers—**

| | |
|--|--|
| Maydole's, list Dec. 1, '85, 25x10x35 | |
| Buffalo Hammer Co., 50x10x35 | |
| Humason & Beckley, 50x10x35 | |
| Atha Tool Co., 50x10x35 | |
| Verres, 40x10x35 | |
| C. Hammond & Son, 40x10x35 | |
| Fayette R. Plumb, 40x10x35 | |
| Artisan's Choice, A. E. Nail, 40x10x35 | |
| Regular Y. & P. A. E. Nail, 50x10x35 | |
| Horseshoe Turning Hammers, 50x10x35 | |
| Other Hammers, 50x10x35 | |
| Cheney's Claw, 40x10x35 | |
| Cheney's Machinist's & Riveting, 50x10x35 | |
| Hartford, Nail Hammers, 40x10x35 | |
| Hartford, Machinists, &c., 50x10x35 | |
| Magnetic Tack, Nos. 1, 2, 3, 1.25, 1.50 & 1.75, 30x10x35 | |
| Nelson Tool Works, 40x10x35 | |
| Warner & Nobles, new list, 25x10x35 | |
| Peck, Stow & Wilcox, 40x10x35 | |
| Sargent's, 40x10x35 | |

Heavy Hammers and Sledges—

| | |
|---------------------------------|--|
| 3 lb and under, 40x10x35 | |
| 3 to 5 lb, 50x10x35 | |
| Over 5 lb, 50x10x35 | |
| Wilkinson's Smiths, 10x10x11x35 | |

Handcuffs and Leg Irons—

See Police Goods.

Handles—**Cross-Cut Saw Handles—**

| | |
|---|--|
| Atkins' No. 1 Loop, 2 pr., 28¢, No. 3, 18¢, No. 6, 15¢, No. 2 and No. 4, Reversible, 18¢, 15¢ | |
| Champion, 15¢ | |

Iron, Wrought or Cast—

| | |
|--|--|
| Door or Thumb, Nos. 0 1 2 3 4, Per doz., \$0.90 1.00 1.10 1.35 1.50 | |
| Roggin's Latches, 40x10x35 | |
| Bronze Iron Drop Latches, 40x10x35 | |
| Jap'd Store Door Handles—Nuts, 1.25¢, Plate, \$1.10; no plate, \$0.88, net | |
| Barn Door, 40x10x35 | |
| Chest and Lifting, 70x10x35 | |

Wood—

| | |
|--|--|
| Saw and Plane, 40x10x40x10x55 | |
| Hammer, Hatchet, &c., 40x10x40x55 | |
| Brad Axl, 40x10x40x55 | |
| Hickory Firmer Chisel, ass'd., 40x10x40x55 | |
| Hickory Firmer Chisel, large, 40x10x40x55 | |
| Apple Firmer Chisel, ass'd., 40x10x40x55 | |
| Apple Firmer Chisel, large, 40x10x40x55 | |
| Socket Firmer Chisel, ass'd., 40x10x40x55 | |
| Socket Framing Chisel, ass'd., 40x10x40x55 | |
| J. B. Smith & Co.'s Pat. File, 40x10x40x55 | |
| File, assorted, 40x10x40x55 | |
| Auger, assorted, 40x10x40x55 | |
| Auger, large, 40x10x40x55 | |
| Pat. Auger, Ives', 30x10x40 | |
| Pat. Auger, Douglass', 30x10x40 | |
| Pat. Auger, Swan's, 30x10x40 | |
| Hoe, Rake, Shovel, &c., 50x10x40 | |

Hangers—

| | |
|---|--|
| Barn Door, old patterns, 60x10x10x70 | |
| Barn Door, New England, 60x10x10x70 | |
| Samson Steel Anti-Friction, 55x10x10x55 | |
| Orleans Steel, 55x10x10x55 | |
| Hamilton Wrought Steel Track, 55x10x10x55 | |
| U. S. Wood Track, 60x10x10x55 | |
| Champion, 60x10x10x55 | |
| Rider and Wooster, Medina Mfg. Co.'s list, 70x10x10x55 | |
| Climax Anti-Friction, 55x10x10x55 | |
| Climax Anti-Friction for Wood Track, 55x10x10x55 | |
| Zenith for Wood Track, 55x10x10x55 | |
| Reed's Steel Arm, 50x10x10x55 | |
| Challenge, Barn Door, 50x10x10x55 | |
| Sterling, 50x10x10x55 | |
| Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00, 50x10x10x55 | |
| Chertree, 50x10x10x55 | |
| Kidder's, 40x10x10x55 | |
| Boss, 50x10x10x55 | |
| Best Anti-Friction, 60x10x10x55 | |
| Duplex (Wood Track), 60x10x10x55 | |
| Terry's Pat., 40x10x10x55 | |
| Terry's Steel Anti-Friction Leader, 50x10x10x55 | |
| Terry's Steel Anti-Friction Ideal, 50x10x10x55 | |
| Cronk's Patent, Steel Covered, 50x10x10x55 | |
| Wood Track Iron Clad, 50x10x10x55 | |
| Carrier Steel Anti-Friction, 50x10x10x55 | |
| Architect, 30x10x10x55 | |
| Eclipse, 30x10x10x55 | |
| Felix, 30x10x10x55 | |
| Richards', 30x10x10x55 | |
| Lane's New Standard, 50x10x10x55 | |
| Lane's Standard, 50x10x10x55 | |
| Hall Bearing Door Hanger, 20x10x10x55 | |
| Warner's Pat., 20x10x10x55 | |
| Stearns' Anti-Friction, 20x10x10x55 | |
| Stearns' Challenge, 25x10x10x55 | |
| Faultless, 40x10x10x55 | |
| American, per set \$1.00, 20x10x10x55 | |
| Rider & Wooster, No. 1, 60x10x10x55; No. 2, 75x10x10x55 | |
| Paragon, Nos. 1, 2 and 3, 40x10x10x55 | |
| Cincinnati, 25x10x10x55 | |
| Paragon, Nos. 5, 6, 7 and 8, 30x10x10x55 | |
| Nickel, Cast Iron, 60x10x10x55 | |
| Nickel, Malleable Iron and Steel, 40x10x10x55 | |
| Scranton Anti-Friction Single Strap, 35x10x10x55 | |
| Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00, 40x10x10x55 | |
| Star, 40x10x10x55 | |
| May, 50x10x10x55 | |
| Barry, 40x10x10x55 | |
| Interstate, 40x10x10x55 | |
| Magie, 40x10x10x55 | |
| Pendulum, Payson's, 40x10x10x55 | |
| Woody, 40x10x10x55 | |

Harness Snaps—S Snaps**Hatchets—**

| | |
|------------------------------------|--|
| American Axe and Tool Co., 40 & 10 | |
| Blood's, 50x10x35 | |
| Hunt's, 50x10x35 | |
| Hurd's, 50x10x35 | |
| Mann's, 50x10x35 | |
| Peck's, 50x10x35 | |
| Underhill's, 40 & 10 | |
| Buffalo Hammer Co., 50x10x35 | |
| Fayette R. Plumb, 50x10x35 | |
| C. Hammond & Son, 50x10x35 | |
| Kelly's, 50x10x35 | |
| Sargent's & Co., 50x10x35 | |
| P. S. & W. Co., 50x10x35 | |
| Ten Eyck Edge Tool Co., 10x10x35 | |
| Collins, 50x10x35 | |
| Schulte, Lohoff & Co., 50x10x35 | |

Hay and Straw Knives—

See Knives.

Hinges—**Blind Hinges—**

| | |
|---|--|
| Parker, 75x25 | |
| Huffer, 50x10x35 | |
| Clark's, Nos. 1, 3, 5, 40 and 75x10x35 | |
| Clark's Mortise Gravity, 50x10x35 | |
| Sargent's, Nos. 1, 3, 5, 11, 13, 75x10x35 | |
| Sargent's, No. 12, 77x10x35 | |
| Reading's Gravity, 75x10x35 | |
| Shepard's, 75x10x35 | |
| Nobles, 75x10x35 | |
| Niagara, 80x10x35 | |
| Buffalo, 80x10x35 | |
| Clark's Genuine Pattern, 80x10x35 | |
| O. S., Lull & Porter, 75x10x35 | |
| Acme, Lull & Porter, 75x10x35 | |
| Queen City Reversible, 70x10x35 | |
| Clark's, Lull & Porter, Nos. 0, 1, 1 1/2, 2, 2 1/2, 3, 75x10x35 | |
| North's Automatic Blind Fixtures, No. 2 for Wood, \$0.00; No. 3, for Brick, \$11.50, 10x10x35 | |

Gate Hinges—

| | |
|---------------------------------|--|
| Western, 40x10x35 | |
| N. E., 40x10x35 | |
| N. E. Reversible, 40x10x35 | |
| Clark's, Nos. 1, 2, 3, 60x10x35 | |
| N. Y. State, 40x10x35 | |
| Automatic, 40x10x35 | |
| Shepard's, 40x10x35 | |

Spring Hinges—

| | |
|--|--|
| Geer's Spring and Blank Butts, 40x10x35 | |
| Union Spring Hinge Co.'s list, March, 1886, 30x10x35 | |
| Barker's Double Acting, 25x10x35 | |
| Union Mfg. Co., 25x10x35 | |
| Bommer's, 30x10x35 | |
| Buckman's, 15x20x35 | |
| Chicago, 30x10x35 | |
| Bardsley's Patent, 40x10x35 | |
| Acme, 30x10x35 | |
| U. S., 40x10x35 | |
| Empire and Crown, 25x10x35 | |
| Hero and Monarch, 55x10x35 | |
| American, Gem and Star, 20x10x35 | |
| Oxford, 20x10x35 | |
| Wilcox, 10x10x35 | |
| Revere's, 40x10x35 | |
| Royal, 40x10x35 | |
| Reliable, 40x10x35 | |
| Champion, 60x10x35 | |
| Stearns, 60x10x35 | |
| Samson, 40x10x35 | |

Wrought Iron Hinges—

| | |
|---|--|
| List February 14, 1891, 50x10x35 | |
| Strap and T., 50x10x35 | |
| Corrugated Strap and T., 50x10x35 | |
| Screw Hook and Eye, 14 to 20 in., 30x10x35 | |
| Strap, 22 to 30 in., 30x10x35 | |
| Screw Hook and Eye, 14 in., 30x10x35 | |
| Screw Hook and Eye, 14 in., 30x10x35 | |
| Roller Blind Hinges, Nos. 32 and 34, 50x10x35 | |
| Roller Blind Hinges, Nos. 232 and 234, 50x10x35 | |
| Roller Plate, 55x10x35 | |
| Roller Raised, 70x10x35 | |
| Plate Hinges, 8, 10 & 12 in., 30x10x35 | |
| "Providence" over 12 in., 30x10x35 | |

Hoes—

| | |
|---|--|
| D. & H. Scovill, 20x10x35 | |
| Lane's Crescent, Planters' Pattern, 45x10x35 | |
| Lane's Razor Blade, Scovill Pattern, 30x10x35 | |
| Maynard, S. & O. Pat., 45x10x35 | |
| Sandusky Tool Co., S. & O. Pat., 70x10x35 | |
| Am. Axe and Tool Co., S. & O. Pat., 50x10x35 | |
| Chattanooga Tool Co., S. & O. Pat., 60x10x35 | |
| Grub, 60x10x35 | |
| Garden, Mortar, &c., 70x10x35 | |
| Planters, Cotton, &c., 70x10x35 | |
| Warren Hoe, 60x10x35 | |
| Magie, 40x10x35 | |

Hog Rings and Rings—

See Rings and Ringers.

Hoisting Apparatus—

See Machines, Hoisting.

Hollow-Ware—

See Ware, Hollow.

Holders—

| | |
|---------------------------|--|
| Bag— | |
| Sprengle's Pat., 40x10x35 | |
| Extension, 40x10x35 | |
| Barber's, 40x10x35 | |
| Ives, 40x10x35 | |
| Diagonal, 40x10x35 | |
| Angular, 40x10x35 | |

File and Tool—

| | |
|----------------------------------|--|
| Bals Pat., 40x10x35 | |
| Nicholson File Holders, 20x10x35 | |
| Dick's Tool Holder, 20x10x35 | |

Hooks—

| | |
|--|--|
| Cast Iron— | |
| Bird Cage, Sargent's List, 60x10x35 | |
| Bird Cage, Reading's list, 60x10x35 | |
| Clothes Line, Sargent's list, 60x10x35 | |

| | |
|--|--|
| Clothes Line, Reading list, 60x10x35 | |
| Ceiling, Sargent's list, 55x10x35 | |
| Harness, Reading list, 55x10x35 | |
| Coat and Hat, Sargent's list, 55x10x35 | |
| Coat and Hat, Reading, 50x10x35 | |

Wrought Iron—

| | |
|---|--|
| Cotton, 40x10x35 | |
| Cotton Pat. (N. Y. Mallet and Handle), 30x10x35 | |
| Wicks, 30x10x35 | |
| Tassel and Picture, T. & S. Mfg. Co., 50x10x35 | |
| Wrought Staples, Hooks, &c., See Wrought Goods. | |

Wire—

| | |
|--|--|
| Wire Coat and Hat, Gem, list April, 1886, 60x10x35 | |
| Wire Coat and Hat, Miles, list April, 1886, 50x10x35 | |
| Indestructible Coat and Hat, 45x10x35 | |
| Wire Coat and Hat, Standard, 60x10x35 | |
| Hat and Coat, 50x10x35 | |
| Steady Ceiling Hooks, 50x10x35 | |
| Belt, 80x10x35 | |
| Atlas, Coat and Hat, 60x10x35 | |
| Williamson's Bird Cage Hooks, list April, 1892, 40x10x35 | |
| Bright Wire Goods—See Wire. | |

Miscellaneous—

| | |
|--|--|
| Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50 | |
| Nolin's Grass, 40x10x35 | |
| Bush, 55x10x35 | |
| Whiffletree—Patent, 55x10x35 | |
| Hooks and Eyes—Malleable Iron, 70x10x35 | |
| Hooks and Eyes—Brass, 70x10x35 | |
| Fish Hooks, American, 50x10x35 | |
| Bench Hooks—See Bench Stops. | |

Horse Nails—See Nails, Horse**Horse Shoes—**

See Shoes, Horse.

Hose, Rubber—

| | |
|--------------------------------------|--|
| Competition, 75x10x35 | |
| Standard, 60x10x35 | |
| Extra, 60x10x35 | |
| N. Y. B. & P. Co., Para., 35x10x35 | |
| N. Y. B. & P. Co., Extra, 40x10x35 | |
| N. Y. B. & P. Co., Dundee, 50x10x35 | |
| Huskers— | |
| Blair's Adjustable, 40x10x35 | |
| Blair's Adjustable Clipper, 40x10x35 | |
| Hubbard's Solid Steel, 40x10x35 | |

Indurated Fiber Ware—

See Ware, Indurated Fiber.

Irons.**Sad—**

| | |
|---|--|
| From 4 to 10, at factory, 100 lb, \$2.30x\$2.40 | |
| Self-Heating, 40x10x35 | |
| Mrs. Pott's Irons, 60x10x35 | |
| Enterprise Star Irons, 60x10x35 | |
| XX Cold Handle Sad Iron, 60x10x35 | |
| Ideal Irons, new list, 50x10x35 | |
| Salamanca Irons, 25x10x35 | |
| B. B. Sad Irons, 30x10x35 | |
| Combined Fluter and Sad Iron, 40x10x35 | |
| Fox Reversible Self-Fluter, 40x10x35 | |
| Chinese Laundry (N.E. Butt Co.), 8 1/2x15 | |
| New England, 8 1/2x15 | |
| Mahony's Troy Pol. Irons, 25x10x35 | |
| Sensible, list Jan. 91, 50x10x35 | |
| Sensible Tailor's Irons, 35x10x35 | |
| National Self-Heating, 30x10x35 | |

Soldering—

| | |
|--|--|
| Soldering Coppers, 10x10x35 | |
| Cover's Adjustable, list Jan. 1, 1886, 35x25 | |

Pinking—

| | |
|-------------------------|--|
| Pinking Irons, 40x10x35 | |
|-------------------------|--|

Jack Screws—See Screws.**Jacks, Wagon—**

| | |
|--------------------|--|
| Daisy, 33x45 | |
| Victor, 33x45 | |
| Lockport, 40x10x35 | |

Kettles—

| | |
|---|--|
| Brass, Spun, Plain, list Jan. 1, '91, 25x10x35 | |
| Brass, Spun, Pld. W.M. list Jan. 1, '91, 20x10x35 | |
| Enameled and Tea—See Ware, Hollow. | |

Keys—

| | |
|--|--|
| Lock, Ass'n list Dec. 30, 1886, 50x10x35 | |
| Eagle, Cabinet, &c., 30x10x35 | |
| Hotchkiss' Brass Blanks, 40x10x35 | |
| Hotchkiss' Copper and Tinned, 40x10x35 | |
| Hotchkiss' Pad. and Cab., 35x10x35 | |
| Ratchet Bed Keys, 40x10x35 | |
| Wollensak Tinned, 50x10x35 | |

Knife Sharpeners—

See Sharpeners, Knife.

Knives—

Butcher, Shoe, &c.

| | |
|--|---|
| Wilson's Butcher Knives, List Dec 8, 1890..... | 25% |
| Ames' Butcher Knives..... | 25% |
| Foster Bros'. Butcher, &c..... | 40% |
| Jordan's A.A. Al Butchers', list..... | net |
| Richols' Butcher Knives..... | 40@10% |
| Wm. Wilson Butcher Knives..... | 3 in. \$2.00; 7 in. \$2.70; 8 in. \$3.80, &c. |
| Ames' Shoe Knives..... | 20@25% |
| Jordan's Bread Knives, 7 doz \$1.50, 15@20% | |
| Jordan's Shoe and Bread..... | 20% |
| Hay and Straw—See Hay Knives. | |
| Table and Pocket—See Cutlery. | |

Brittan, Graham & Mathes, list Jan. 1890.
Perkins' Burglar Proof, 60&10&15
Plate, 33&4&25
Barnes Mfg. Co., 40&40&105
Yale, net prices
Deitz Flat Key, 30&105
L. & C. Round Key Latches, 30&105
L. & C. Flat Key Latches, 35&105
Romer's Night Latches, 155
Brooklyn Latches, 50&105
Shepardson or U. S., 355
Seed's N. Y. Hasp Lock, 255

Padlocks—

List June 10, 1891.
Norwich Lock Mfg. Co., old list, 70&25
Yale Lock Mfg. Co.'s, net prices
Eagle, 25&25
Eureka, Eagle Lock Co., 40&25
Romer's, Nos. 0 to 91, 40&105
Romer's Scandinavian, &c., Nos. 100 to 505, 155
A. E. Deitz, 405
Champion Padlocks, 405
Hotchkiss, 305
Star, 605
Horseshoe, 405
Barnes Mfg. Co., 40&40&105
Nock's, 405
Brown's Pat., 255
Scandinavian, 60&255
E. T. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140, 405
Other Nos., 405
Ames Sword Co. up to No. 150, 405
Ames Sword Co. above No. 150, 505
Slaymaker, Barry & Co., 85&55
No. 41 line, 45&105
No. 61 line, 50&55
No. 21 line, 755

Sash, &c.—

Clark's No. 1, 10; No. 2, 85 gr., 33&45
Ferguson's, 33&45
Victor, 60&10&25
Walker's, 105
Attwell Mfg. Co., 25&33&45
Reading, 60&10&60&10&105
Hammond's Window Springs, 405
Common Sense, Jap. Cop., 405
Br'zed, 405
Common Sense, Nickel Plated, 405
Universal, 305
Kempshall's Gravity, 605
Kempshall's Model, 60&60&105
Corbin's Daisy, list Feb. 15, 1880, 705
Payson's Perfect, 60&105
Huginin's Sash Balances, 25&5&25
Huginin's New Sash Locks, 25&5&25
Stoddard's "Practical", 105
Ives' Patent, 60&10&60&10&55
Fish (Liesche's Pat.), No. 100, 405
No. 105, 405
Davis, Bronze, Barnes Mfg. Co., 505
Champion Safety, list January, 1889, 705
Security, 705
Giant, list Jan., 1892, 70&55
Wolcott's, 60&10&55
Monarch, 505

Lumber Tools—

See Tools, Lumber.

Lustro—

Four-ounce bottles, 4 doz, \$1.75; 5 doz, \$17.00

Machines.

Boring—
Without Augers.
Douglas, 5.50 60.75
Snell's, Rice's Pat., 5.50 67.50
Jennings', 5.50 67.50
Other Machines, 2.35 2.75
Phillips' Patent
with Auger, 7.50 7.50
Miller's Falls, 7.50 255

Fluting—
Knox, 4 1/2-inch Rolls, \$3.25 each; 355
Knox, 6-inch Rolls, \$3.00 each; 355
Eagle, 3 1/2-inch Rolls, \$2.15, 355
Eagle, 5 1/2-inch Rolls, \$2.55, 355
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in., \$4.50 each, 355
Crown Jewel, 6 in., \$3.50 each, 355
American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each, 355
Domestic Fluter, 1.50
Geneva Hand Fluter, White Metal, 1.50
Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00, 305
Shepard Hand Fluter, No. 85, per doz \$15.30, 405
Shepard Hand Fluter, No. 110, 405
Shepard Hand Fluter No. 95, 405
Clark's Hand Fluter, 405
Combined Fluter and Sad Iron, 405
Buffalo, 405

Hoisting—
Moore's Hand Hoist, with Lock Brake, 205
Moore's Differential Pulley Block, 405
Energy's Mfg. Co.'s, 255
Sure Grip Steel Tackle Blocks, 255

Washing—
Anthony Wayne, 4 doz, No. 1, \$51; No. 2, \$45; No. 3, \$42.
Western Star, 4 doz, No. 2, \$45; No. 2 \$48.
Weissell, 4 doz \$54.00
Fair and Square, 4 doz \$42.00

Mallets—
Hickory, 30&10&20&10&105
Lignumvitae, 30&10&20&10&105
B. & L. Block Co., Hickory & L. V., 30&30&105

Mattocks—Regular list.
60&10&60&10&55

Measures—
ard Fiberware, No. 1, peck 4 dozen, \$4; 1/2 peck, \$3.50.

Meat Cutters—
See Cutters, Meat.

Menders, Harness—
Per doz, \$2.00

Mills—
Coffee—
Box and Side, List Jan. 1, 1888, 60&105
Net prices are often made which are lower than above discount.
American Enterprise Mfg. Co. 20&10&305
The Swift, Lane Bros., 305

Mincing Knives—
See Knives, Mincing.

Molasses Gates—
See Gates, Molasses.

Money Drawers—
See Drawers, Money.

Mowers, Lawn—
Philadelphia, 60&105
Pennsylvania and Continental, 605
New Model and Excelsior, 60&60&105
Other Machines, 60&10&60&755

Muzzles—
Safety, 4 doz, \$3.00, 255

Nails.—
Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, May 1, '92, 80&10&105
Tack Mfrs' list, 70&70&105
Wire Nails, Standard Penny.
Card, Apr. 11, '92 base, \$1.85&1.90

Horse—
Nos. 6 7 8 9 10
American, 84 84 84 84 84, net
Ausable, 285 265 255 245 235
Clinton, Fin., 195 175 165 155 145, 40&5&5&25
Essex, 285 265 255 245 235, 40&10&5&25
Lyra, 195 175 165 155 145, 40&55
Snowden, 195 175 165 155 145, 40&55
Vulcan, 235 215 205 195 185, 255
Northwestern, 235 215 205 195 185, 255

Picture—
Brass Head, Sargent's list, 60&60&105
Brass Head, Combination list, 50&105
Porcelain Head, Sargent's list, 50&10&105
Porcelain Head, Combination list, 40&105
Niles' Patent, 405
Nail Pullers—See Pullers, Nail.
Nail Sets—See Sets, Nail.
Nut Crackers—
See Crackers, Nut.
Nuts—List Dec. 18, 1889.
Square, Hex.
Hot Pressed, 3.55 5.95 off list
Cold Punched, 5.00 5.10 off list
In packages of 100 lb, add 1-10¢ lb, net; in packages less than 100 lb, add 1/2¢ lb, net.

Oakum—
Best or Government, 405
U. S. Navy, 405
Navy, 405
Oilers—
Zinc and Tin, 65&10&70&55
Brass and Copper, 60&10&50&10&55
Malleable, Hammers' Improved, No. 1, \$3.60; No. 2, \$4.00; No. 3, \$4.40, 10&10&55
Malleable, Hammers' Old Pattern, same list, 405
Prior's Pat. or "Paragon" Zinc, 60&10&105
Prior's Pat. or "Paragon" Brass, 505
Olmstead's Tin and Zinc, 505
Olmstead's Brass and Copper, 505
Broughton's Zinc, 605
Broughton's Brass, 505
Gem, P. D. & Co., 405
Steel, Draper & Williams, 505

Openers, Can—
Messenger's Comet, 4 doz \$3.00, 255
Duplex, 4 doz \$2.75, 405
Lyman's, 4 doz \$3.75, 205
No. 4, French, 4 doz \$2.25, 55&605
No. 5, Iron Handle, 4 gr \$8.00, 45&505
Eureka, 4 doz \$2.50, 105
Sardine Scissors, 4 doz \$2.75, 405
Star, 4 doz \$2.75, 405
Sprague, No. 1, \$2.00; 2, \$2.25; 3, \$2.50, 50&10&105
Excelsior, No. 1 \$2.50; No. 2, \$1.50, 405
World's Best, 4 gross, No. 1, \$12.00, 605
No. 2, \$24.00; No. 3, \$36.00, 50&105
Universal, 4 doz \$3.00, 55&55
Domestic, 4 doz \$2.00, 455
Champion, 4 doz \$2.00, 505

Packing, Steam—
Rubber—
Standard, 70&70&105
Extra, 60&60&55
N. Y. B. & P. Co., Standard, 605
N. Y. B. & P. Co., Empire, 605
N. Y. B. & P. Co., Salamander, 255
Jenkins' Standard, 4 doz \$6.00, 25&25&55

Miscellaneous—
American Packing, 10&115 405
Russia Packing, 145 405
Italian Packing, 135 405
Cotton Packing, 155 405
Jute, 75&85 405

Pails—
Galvanized—
Quarts 10 12 14
Hill's Light Weight, 4 doz \$2.75 3.00 3.25
Hill's Heavy Weight, 4 doz 3.00 3.25 3.75
Helwig's, 2.50 2.75 3.00
Sidney Shepard & Co., 2.55 2.85 3.05
Iron Clad, 2.50 2.75 3.00
Fire Buckets, 2.75 3.25 3.50
Buckets—See Well Buckets.

Indurated Fiber Ware—255
Star Pails, 12 qt., 4 doz \$5.40
Stable and Milk, 14 qt., 4 doz \$6.00
Fire Pails, deep, 4 doz \$5.40
Fire Pails, round bottom, 4 doz \$7.80

Standard Fiber Ware—
Plain. Dec'd
Water Pails, 12 qt., 4 doz \$4.00 \$4.50
Dairy Pails, 14 qt., 4 doz 4.50 5.00
Fire Pails, No. 1, 12 qt., 4 doz 4.50 5.00
Fire Pails, No. 2, 14 qt., 4 doz 5.00 5.50
Sugar Pails, 6.00 6.50
Horse Pails, 5.00
Buggy Pails, 4.00
Stop Jars (bal. trap), 8.00 9.00
Chamber Pails, 14 qt., 6.50 7.50

Pans—
Dripping—
Small sizes, 4 doz \$6.45
Large sizes, 4 doz \$5.45
Silver & Co. (Covered), 405
Fry—
Standard List:
No. 1, 4 doz \$5.00 \$3.75 \$4.25 \$4.75 \$5.25
No. 2, 4 doz 5.00 3.75 4.25 4.75 5.25
No. 3, 4 doz 6.00 4.75 5.25 5.75 6.25
Polished, regular goods, 75&75&105
Acme Fry Pans, 60&55

Dust—
Steel Edge, No. 1, 4 doz \$1.75

Paper and Cloth—
Sand and Emery—
List April 19, 1886, 50&10&50&10&55
Sibley's Emery and Crocus Cloth, 305

Parers—
Apple—
Advance, 4 doz \$4.75
Baldwin, 4 doz 5.25
Bonanza, each 5.00
Daisy, 4 doz 4.00
Dandy, each 7.50
Eclipse, 4 doz 4.25
Eureka, 1888, each 16.00
Family Bay State, 4 doz 12.00
Payson's, 4 doz 5.00
Gold Medal, 4 doz 4.00
Ideal, 4 doz 4.00
Improved Bay State, 4 doz 27.00&30.00
Little Star, 4 doz 4.50
Monarch, 4 doz 13.50
New Lightning, 4 doz 5.50
Orion, 4 doz 4.00
Penn., 4 doz 4.00
Perfection, 4 doz 4.00
Pomona, 4 doz 4.00
Rocking Table, 4 doz 6.00
Turn Table, 4 doz 4.50
Victory, 4 doz 13.50
Viceroy, 4 doz 4.00
White Mountain, 4 doz 4.00
72, 4 doz 4.25
78, 4 doz 7.00

Potato—
White Mountain, 4 doz \$4.50
Antrim Combination, 4 doz \$5.50
Hoosier, 4 doz \$13.50
Saratoga, 4 doz \$5.50

Pencils—
Faber's Carpenters', high list 505
Faber's Round Gilt, 4 gr \$5.25
Dixon's Lead, 4 gr \$4.50
Dixon's Lumber, 4 gr \$6.75
Dixon's Carpenters', 105

Picks—
Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00, 60&10&60&10&55

Picture Nails—
See Nails, Picture.

Pinking Irons—
See Irons, Pinking.

Pins—
Bow—
Humason, Beckley & Co.'s, 60&105
Sargent & Co.'s, \$17 and \$18, 60&105
Peck, Stow & W. Co., 50&10&50&10&55

Curtain—
Silvered Glass, net
White Enamel, net

Escutcheon—
Iron, list Nov. 11, 1885, 50&10&50&10&55

Pipe, Wrought Iron—
List July 21, 1892.
1 1/2 and under, Plain, 60&55&60&105
1 1/2 and under, Galvanized, 50&55&50&105
1 1/2 and over, Plain, 70&55&70&105
1 1/2 and over, Galvanized, 60&55&60&105
Boiler Tubes, 505
Size up to 2 1/2 in., inclusive, 57 1/2¢ 605
Size 3 in. and larger, 605
Casing, 555
Inserted Joints Casing, 505
Steel Boiler Tubes, 305

Planes and Plane Irons—
Wood Planes—
Molding, 40&10&40&10&105
Bench, First quality, 50&10&50&10&105
Bench, Second quality, 55&10&55&10&105
Bailey's (Stanley R. & L. Co.), 50&105

Iron Planes—
Bailey's (Stanley R. & L. Co.), 50&105
Miscellaneous Planes (Stanley R. & L. Co.), 25&105
Steers' Iron Planes, 35&40&105
Meriden Iron Co.'s, 40&40&105
Davis' Iron Planes, 40&40&105
Birmingham Plane Co., 50&50&105
Gage Tool Co.'s Self-Setting, 20&10&105
Chaplin's Iron Planes, 40&40&105
Sargent's, 605
Standard Tool Co., 60&50&55

Plane Irons—
Butcher's, \$5.00&5.25 to \$305
Buck Bros., 305
Auburn Thistle, 305
Ohio, 30&105
Sandusky, 255
L. & J. White, 50&105
Stanley R. & L. Co., 50&105

Plates—
Felloe, 4 doz \$6.45

Pliers and Nippers—
Button's Patent, 50&50&105
Hall's No. 2, 5 in., \$18.50; No. 4, 7 in., \$21.00, 405
Humason & Beckley Mfg. Co., 50&50&105
Lindsay's Giant, 33&45
Gas Pliers, 605
Gas Pliers, Custar's Nickel Plated, 60&55
Eureka Pliers and Nippers, 405
Russell's Parallel, 255
P. S. & W. Cast Steel, 505
P. S. & W. Tinner's Cutting Nippers, add 65¢
Carew's Pat. Wire Cutters, 105
Morrell's Parallel, 4 doz \$12.00, 20&55
Cronk's 8 in., \$15.00; 10 in., \$21.00, 50&50&55
Cronk's Button Pattern, 50&10&605
Cronk's Carrier Pliers, 60&60&55

Plumbs and Levels—
Regular List, 75&10&75&10&55
Stanley's Duplex, 20&105
Stanley's Handy, 20&105
Dixon's, 70&10&70&10&105
Pocket Levels, 70&10&70&10&105
Davis' Iron Levels, 305
Davis' Inclination, 10&105

Poachers, Egg—
Buffalo Steam Egg Poachers, 4 doz, No. 1, \$6.00; No. 2, \$9.00, 255
Silver & Co., 6-Ring, 4 doz, \$4.00; 3-Ring, \$2.00

Pokes, Animal—
Bishop's I. X. L., 4 doz \$6.00
Bishop's O. K., 4 doz \$5.25
Bishop's Pioneer, 4 doz \$3.75
Bishop's American, 4 doz \$2.75
Eagle, Double Stale, 4 doz \$5.75
Eagle, Single Stale, 4 doz \$3.75
Buckeye, Single Stale, 4 doz \$2.75
Bolding, 4 doz \$6.00

Police Goods—
R. I. Tool Co., Handcuffs, \$15.00 4 doz 105
R. I. Tool Co., Leg Irons, \$25.00 4 doz 105
Towers', 255
Daley's Improved Handcuffs, 2 Hands, Polished, 4 doz, \$48.00; 2 Nickel, \$57.00; 3 hands, Polished, 4 doz, \$72.00; 2 Nickel, \$84.00, 255
J. P. Lovell's Police Goods, 255

Polish—
Metal—
Prestoline, 305
Prestoline Paste, 355
Gaston's Silver Compound, 355

Stove—
Joseph Dixon's, 4 gr, \$6.00, 105
Gem, 4 gr, \$4.50, 105
Gold Medal, 4 gr, \$6.00, 255
Lustro, 4 gr, \$4.75
Rising Sun, 5 gr, \$6.00, 405
Dixon's Plumbago, 4 gr, \$8.00
Boynton's Noon Day, 4 gr, \$13.00
Parlor Stove Enamel, 4 gr
Yates' Liquid, 2 3 5 10 gal
Yates Standard Paste Polish, 10 12 cans, 125¢

Poppers, Corn—
Round or Square, 1 qt., 4 gr \$10.00&10.50
Round or Square, 1 1/2 qt., 4 gr \$15&15.50
Round or Square, 2 qt., 4 gr \$18.50&19.00

Post Hole and Tree Augers and Diggers—
See Diggers, Post Hole, &c.

Potato Parers—
See Parers, Potato.

Pots—
Glue—
Tinned, 40&10&40&10&55
Enamelled, 40&10&40&10&55
Family, Howe's "Eureka", 405
Family, L. F. C.'s "Handy", 505

Powder—
In Canisters—
Fine Sporting, 1 lb each, \$0.90
Duck, 1 lb each, .60
Rifle, 1 lb each, .30
Rifle, 1/2 lb each, .18
Rifle, 1/4 lb each, .13
In Kegs—
Rifle, 25-lb kegs, \$5.00
Rifle, 12 1/2-lb kegs, 2.75
Rifle, 6 1/2-lb kegs, 1.50
Duck, 12 1/2-lb kegs, 5.75
Duck, 6 1/2-lb kegs, 3.00
Trap, 25-lb kegs, 6.00
Trap, 12 1/2-lb kegs, 3.25
Trap 6 1/2-lb kegs, 1.75

Snaps, Harness, &c.

| | |
|----------------------------------|-----|
| Anchor (T. & S. Mfg. Co.) | 50¢ |
| Fitch's (Bristol) | 50¢ |
| Hotchkiss | 10¢ |
| Andrews | 50¢ |
| Sargent's Patent Guarded | 70¢ |
| German, new list | 40¢ |
| Covert, New Patent | 50¢ |
| Covert, New E. E. | 60¢ |
| Covert Spring | 60¢ |
| Covert's Saddlery Works' Triumph | 33¢ |

Snaths, Scythe

| | |
|------|-----|
| List | 50¢ |
|------|-----|

Soldering Irons

See Irons, Soldering.

Spittoons, Cuspidors, &c.**Standard Fiberware**

| | |
|--|--|
| Cuspidors, 8½-inch, # doz., No. 5, \$5; No. 5A, \$6. | |
| Spittoons, Daisy, 8-inch, No. 1, \$4; 10 and 11 inch, \$6. | |

Spoke Shaves

See Shaves, Spoke.

Spoke Trimmers

See Trimmers, Spoke.

Spoons and Forks**Tinned Iron**

| | |
|--|-----|
| Basting, Cen. Stamp, Co.'s list | 70¢ |
| Standard Table and Tea, Cen. Stamp, Co.'s list | 70¢ |
| Buffalo, S. S. & Co. | 33¢ |

Silver Plated

| | |
|------------------------------|-----|
| 4 months or 5¢ cash 30 days: | |
| Meriden Brit. Co., Rogers | 40¢ |
| C. Rogers & Bros. | 40¢ |
| Rogers & Bros. | 40¢ |
| Reed & Barton | 40¢ |
| Wm. Rogers Mfg. Co. | 40¢ |
| Simpson, Hall, Miller & Co. | 40¢ |
| Holmes & Edwards Silver Co. | 40¢ |
| L. Boardman & Son | 40¢ |

Miscellaneous

| | |
|--|-----|
| Holmes & Edwards Silver Co. | |
| No. 67 Mexican Silver | 50¢ |
| No. 30 Silver Metal | 50¢ |
| No. 24 German Silver | 50¢ |
| No. 60 Nickel Silver | 50¢ |
| No. 49 Nickel Silver | 50¢ |
| Wm. Rogers Mfg. Co. | 50¢ |
| Rogers' Silver Metal | 50¢ |
| 18¢ Rogers' German Silver | 50¢ |
| 22¢ Rogers' Nickel Silver | 50¢ |
| German Silver | 50¢ |
| German Silver, Hall & Elton | 50¢ |
| Nickel Silver | 50¢ |
| Britannia | 50¢ |
| Boardman's Nickel Silver | 50¢ |
| 1891 | 50¢ |
| Boardman's Britannia Spoons, case lots | 50¢ |

Springs**Door**

| | |
|--|------|
| Torrey's Rod, 39 in. | 1.25 |
| Gray's, # gr. \$30.00 | 25¢ |
| See Rod, # gr. \$30.00 | 25¢ |
| Warner's No. 1, # doz \$2.50; No. 2, \$3.30 | 50¢ |
| Gem (Coll), list April 19, 1886 | 10¢ |
| Star (Coll), list April 19, 1886 | 20¢ |
| Victor (Coll) | 60¢ |
| Champion (Coll) | 60¢ |
| Cowell's, No. 1, # doz \$18.00; No. 2, \$15.00 | 50¢ |
| Rubber, complete, # doz \$4.50 | 55¢ |
| Hercules | 50¢ |

Carriage, Wagon, &c.

| | |
|---|-----|
| Elliptic, Concord, Platform and Half Scroll | 60¢ |
| Cliff's Bolster Springs | 25¢ |

Squares

| | |
|---------------------------------------|-----|
| Steel and Iron | 85¢ |
| Nickel-Plated | 85¢ |
| Try Square and T Bevels | 60¢ |
| Diston's Try Square and T Bevels | 50¢ |
| Winterbottom's Try and Miter | 30¢ |
| Starrett's Micrometer Caliper Squares | 25¢ |

| | |
|-----------------------------|-----|
| Avery's Flush Bevel Squares | 40¢ |
| Avery's Bevel Protractor | 50¢ |

Squeezers**Fodder**

| | |
|------------------|-----|
| Blair's | 50¢ |
| Blair's "Climax" | 50¢ |

Lemon

| | |
|---|-----|
| Porcelain Lined, No. 1 | 60¢ |
| Wood, No. 2 | 25¢ |
| Wood, Common | 17¢ |
| Dunlap's Improved | 37¢ |
| Sammis | 12¢ |
| \$18 # doz | 25¢ |
| Jennings' Star | 25¢ |
| The Boss | 25¢ |
| Dean's, Nos. 1, # doz \$2.50; 2, \$3.30; 3, \$1.90; Queen, \$5.00 | 50¢ |
| Little Giant | 50¢ |
| King | 40¢ |
| Hotchkiss Straight Flash | 12¢ |
| Silver & Co., Glass | 12¢ |
| Manny Lemon Juice Extractor | 12¢ |
| Standard Improved | 12¢ |

Standard Fiber Ware

See Ware, Standard Fiber.

Staples**Blind**

| | |
|---------------------------|--------------|
| Barbed, ½ in. and larger | 7¢ |
| Barbed, ¾ in. | 8¢ |
| Fence Staples, Galvanized | Same price |
| Fence Staples, Plain | See Trd. Rep |

Steelyards**Stocks and Dies**

| | |
|--------------------------|-----|
| Blacksmith's: | |
| Waterford Goods | 35¢ |
| Butterfield's Goods | 35¢ |
| Lightning Screw Plate | 25¢ |
| Reece's New Screw Plates | 25¢ |
| Reversible Ratchet | 30¢ |
| Gardner | 25¢ |
| Green River | 25¢ |

Stops, Bench

| | |
|---|-----|
| Morrill's | 50¢ |
| Hotchkiss's | 50¢ |
| Weston's, No. 1, \$10; No. 2, \$9 | 25¢ |
| McGill's, # doz \$3 | 10¢ |
| Cincinnati | 25¢ |
| Terrell's Nos. 1 and 2, # doz, \$3; No. 3, \$3.60 | 30¢ |

Stone**Sythe Stones**

| | |
|---------------------------------|-----|
| Pike Mfg. Co., list April, 1892 | 33¢ |
|---------------------------------|-----|

Oil Stones, &c.

| | |
|-------------------------------------|--------|
| Pike Mfg. Co. | Price |
| Hindostan No. 1 | 8¢ |
| Sand Stone | 5¢ |
| Washita Stone, Extra | 50¢ |
| Washita Stone, No. 1 | 40¢ |
| Washita Stone, No. 2 | 30¢ |
| Washita Slips, Extra | 80¢ |
| Washita Slips, No. 1 | 70¢ |
| Arkansas Stone, No. 1, 3 to 5 ½ in. | \$2.80 |
| Arkansas Stone, No. 1 ½ to 8 in. | \$3.50 |
| Turkey Oil Stone, 4 to 8 in. | \$3.00 |
| Turkey Slips | \$3.00 |
| Lake Superior, Chase | 13¢ |
| Lake Superior Slips, Chase | 20¢ |

Stove Polish

See Polish, Stove.

Stretchers, Carpet

| | |
|-------------------------|-----|
| Cast Steel, Polished | 20¢ |
| Cast Iron, Steel Points | 20¢ |
| Socket | 17¢ |
| Bullard's | 25¢ |

Strops, Razor

| | |
|--|-----|
| Genuine Emerson | 60¢ |
| Imitation | 20¢ |
| Torrey's | 20¢ |
| Badger's Belt and Com. | 20¢ |
| Lamont Combination | 20¢ |
| Jordan's Pat. Padded, list Nov. 1, '89 | 50¢ |
| Electric Cutlery Co. | Net |
| Campbell Cutlery Co. | Net |

Stuffer or Fillers,**Sausage**

| | |
|--|-----|
| Miles' Challenge, # doz \$20 | 50¢ |
| Perry, # doz, No. 1, \$15.00; No. 2, \$21.00 | 50¢ |
| Draw Cut No. 4, each \$30.00 | 20¢ |
| Enterprise Mfg. Co. | 20¢ |
| Silver's | 40¢ |

Sweepers, Carpet and Lawn

| | |
|-----------------------|---------|
| Bissell No. 5 | 17¢ |
| Bissell No. 8 | 20¢ |
| Bissell, Grand | 26¢ |
| Standard | 24¢ |
| Domestic | 21¢ |
| Domestic, No. 2 | 22¢ |
| Grand Rapids | 24¢ |
| Crown Jewel, No. 1 | \$19.00 |
| Crown Jewel, No. 3 | \$20.00 |
| Magie | 15¢ |
| Improved Parlor Queen | |
| Nikeleed | 27¢ |
| Japaned | 24¢ |
| Excelsior | 22¢ |
| Garland | 18¢ |
| Parlor Queen | 24¢ |
| Housewife's Delight | 15¢ |
| Queen | 16¢ |
| Queen, with band | 18¢ |
| King | 24¢ |
| Steel, Improved | 18¢ |
| Hub | 16¢ |
| Cog-Wheel | 16¢ |
| Easy | 22¢ |
| Monarch | 22¢ |
| Goshen | 21¢ |
| Ladies' Friend | 15¢ |
| Advance | 18¢ |
| Supreme | 22¢ |

Lawn

| | |
|-------------------|-----|
| Thompson Mfg. Co. | 30¢ |
|-------------------|-----|

Tacks, Brads, &c.

List October 19, 1889. Old established straight weights. Short weight goods are sold at lower prices.

| | |
|-------------------------------|-----|
| Carpet Tacks— | |
| American, Blued | 60¢ |
| American, Tin'd and Cop'd | 70¢ |
| Steel, Bright and Blued | 60¢ |
| Steel, Tinned and Coppered | 70¢ |
| Swedes Iron, Blued | 75¢ |
| Swedes Iron, Tinned | 75¢ |
| American Iron Tacks, Domestic | 60¢ |
| Swedes Iron Tacks— | |
| S. S., Blued | 60¢ |
| S. S., Tinned | 70¢ |
| Lanc., Blued | 55¢ |
| Lanc., Tinned | 60¢ |
| Gimp and Lace Tacks— | |
| S. S., Blued | 62¢ |
| S. S., Tinned | 60¢ |
| Lanc., Blued | 55¢ |
| Lanc., Tinned | 60¢ |
| Basket and Trimmers' Tacks— | |
| Lanc. | 52¢ |
| S. S. | 60¢ |
| Hungarian Nails | 60¢ |
| Common and Patent Brads | 55¢ |
| Leathered Tacks | 10¢ |
| Brush Tacks, S. S. | 35¢ |
| Looking Glass Tacks, S. S. | 35¢ |
| Picture-Frame Points, S. S. | 35¢ |
| Finishing Nails | 60¢ |
| Trunk and Clout Nails— | |
| Black | 62¢ |
| Tinned or Coppered | 60¢ |
| Basket Nails | 60¢ |
| Chair Nails | 53¢ |
| Cigar Box Nails | 45¢ |
| Tin Capped Nails | 50¢ |

Miscellaneous**Double Point**

| | |
|----------------------------------|-----|
| Wire Carpet Nails | 90¢ |
| Plymouth Rock Steel Carpet Tacks | 25¢ |

Wire Brads and Nails

| | |
|---|-----|
| Steel-Wire Brads, R. & E. Mfg. Co.'s list | 50¢ |
|---|-----|

See also Nails, Wire.

Tapes, Measuring

| | |
|----------------------------|-----|
| American | 40¢ |
| Spring | 40¢ |
| Chesterman's, Regular list | 25¢ |

Thermometers

| | |
|----------|-----|
| Tin Case | 80¢ |
|----------|-----|

Thimble Skeins—See Skeins.**Ties, Bale—Steel.**

| | |
|---------------------|-----|
| Standard Wire, list | 50¢ |
|---------------------|-----|

Tinners' Shears, &c

See Shears, Tinners' &c.

Tinware

| | |
|---|-----|
| Stamped, Japanned and Pieced, list Jan 20, 1887 | 70¢ |
|---|-----|

Tire Benders, Upsetters, &c.—See Benders and Upsetters, Tire.**Tools****Coopers'**

| | |
|----------------------------|-----|
| Bradley's | 20¢ |
| Barton's | 20¢ |
| L. & J. White | 20¢ |
| Albertson Mfg. Co. | 25¢ |
| Beatty's | 30¢ |
| Sandusky Tool Co. | 30¢ |
| Shaves Cincinnati Tool Co. | 20¢ |

Lumber

| | |
|---|--------------------------------|
| Ring Peavies, "Blue Line" | 20¢ |
| Ring Peavies, Common | 18¢ |
| Steel Socket Peavies | 21¢ |
| Mail Iron Socket Peavies | 19¢ |
| Cant Hooks, "Blue Line" | 10¢ |
| Cant Hooks, Common Finish | 14¢ |
| Cant Hooks, Mail Socket Clasp, "Blue Line" Finish | 16¢ |
| Cant Hooks, Mail Socket Clasp, Common Finish | 14¢ |
| Cant Hooks, Clip Clasp, "Blue Line" Finish | 12¢ |
| Cant Hooks, Clip Clasp, Common Finish | 12¢ |
| Hand Spikes | 6 ft., \$15.00; 8 ft., \$20.00 |
| Pike Poles, Pike & Hook, # doz, 12 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50 | |
| Pike Poles, Pike only, # doz, 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00 | |
| Pike Poles, not ironed, # doz, 12 ft., \$6.00; 14 ft., \$7.00; 16 ft., \$9.00; 18 ft., \$12.00; 20 ft., \$16.00 | |
| Setting Poles, # doz, 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00 | |
| Swamp Hooks | 18¢ |

Saw

| | |
|--------------------|-----|
| Atkins' Perfection | 12¢ |
| Atkins' Excelsior | 10¢ |
| Atkins' Giant | 14¢ |

Tobacco Cutters

See Cutters, Tobacco.

Transom Lifters

See Lifters, Transom.

Traps**Game**

| | |
|----------------------|-----|
| Newhouse | 40¢ |
| Onaida Pattern | 70¢ |
| Game, Blake's Patent | 40¢ |

Mouse and Rat

| | |
|--|-----|
| Mouse Wood, Choker, # doz holes, 9@10¢ | |
| Mouse, Round Wire | 15¢ |
| Mouse, Cage, Wire | 25¢ |
| Mouse, Catch-em-alive | 15¢ |
| Mouse, Bonanza | 10¢ |
| Rat, Decoy | 10¢ |
| Ideal | 10¢ |
| Cyclone | 25¢ |
| Hotchkiss Metallic Mouse, 5-hole traps | 75¢ |
| # doz, 75¢; in full cases, # doz. 60¢ | |
| Hotchkiss New Rat Killer | 15¢ |
| Schuyler's Rat Killer | 15¢ |

Triers

| | |
|-------------------|-----|
| Butter and Cheese | 25¢ |
|-------------------|-----|

Trimmers, Spoke

| | |
|--------------------------------------|-----|
| Bonney's | 10¢ |
| Stearns | 10¢ |
| Ives, No. 1, \$15.00; No. 2, \$12.00 | 50¢ |

Trowels

| | |
|--------------------------------|-----|
| Lothrop's Brick and Plastering | 20¢ |
|--------------------------------|-----|

Reed's Brick and Plastering

| | |
|--|-----|
| Reed's Brick and Plastering | 15¢ |
| Diston's Br'k and Plastering | 25¢ |
| Pease's Plastering | 25¢ |
| Clement & Maynard's | 20¢ |
| Rose's Brick | 15¢ |
| Brade's Brick | 25¢ |
| Worral's Brick and Plastering | 20¢ |
| Garden | 70¢ |
| Cleves' Angle Trowel, # gro, No. 1, \$36; No. 2, \$30; No. 3, \$15 | 10¢ |

Trucks, Warehouse, &c.

| | |
|--------------------------|-----|
| B. & L. Block Co.'s list | 40¢ |
| Thompson Mfg. Co. | 25¢ |

Tubes, Boiler**See Pipe.****Twine****Flax Twine**

| | |
|---|-----|
| No. 9, ¼ and ½ B. Balls | 25¢ |
| No. 12, ¼ and ½ B. Balls | 25¢ |
| No. 18, ¼ and ½ B. Balls | 20¢ |
| No. 24, ¼ and ½ B. Balls | 20¢ |
| No. 36, ¼ and ½ B. Balls | 18¢ |
| No. 204 Matras, ¼ and ½ B. Balls | 54¢ |
| Chalk Line, Cotton, ¼ B. Balls | 25¢ |
| Mason Line, Linen, ¼ B. Balls | 55¢ |
| 2-Ply Hemp, ¼ and ½ B. Balls (Spring 4 Twine) | 15¢ |
| 3-Ply Hemp, 1 B. Balls | 16¢ |
| 3-Ply Hemp, 1½ B. Balls | 15¢ |
| Cotton Wrapping, 5 Balls to B. 15¢ | 16¢ |
| 2, 3, 4 and 5 Ply Jute, ¼ B. Balls | 10¢ |
| Wool | 15¢ |
| Paper | 15¢ |
| Cotton Mops, 6, 9, 12 and 15 # to doz. | 18¢ |

Vises

| | |
|-----------|-----|
| Solid Box | 50¢ |
|-----------|-----|

Parallel

| | |
|------------------------------|-----|
| Fisher & Norris Double Screw | 15¢ |
| Stephens | 25¢ |
| Parker's | 30¢ |
| Wilson's | 50¢ |
| Howard's | 40¢ |
| Bonney's | 40¢ |
| Miller's Falls | 40¢ |
| Trenton | 40¢ |
| Merrill's | 70¢ |
| Sargent's | 40¢ |
| Backus and Union | 40¢ |
| Double Screw Leg | 15¢ |
| Prentiss | 20¢ |
| Simpson's Adjustable | 40¢ |
| Moore's | 20¢ |
| Massey Quick Action | 30¢ |

Saw Filers

| | |
|-------------------------------|-----|
| Bonney's, Nos. 2 & 3, \$15.00 | 40¢ |
| Stearns | 35¢ |
| Stearns' Silent Saw Vises | 33¢ |
| Hopkins | 10¢ |
| Reading | 10¢ |
| Wentworth | 10¢ |

Miscellaneous

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||
||

Washers—

Size hole..... 5-16 1/4 1/2 to 1 1/2
Washers..... 6 5 3.50 3
In lots less than 200 b, #, add 1/4, 5-b
boxes 1¢ to list.

Wedges—

Iron..... # 3 1/4
Steel..... # 3 1/4

Weights, Sash—

Solid Eyes..... # ton \$18.00 @ \$19.00

Well Buckets, Galvanized—
See Buckets, Well, Galvanized.**Wheels, Well—**

8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25

Wire and Wire Goods—

Iron—
Market,
Br. & Ann., Nos. 0 to 18, 75¢ to 10¢ to 5¢
Cop'd, Nos. 0 to 18..... 75¢ to 5¢

Galv., Nos. 0 to 18..... 70¢ to 5¢

Stone, Tin'd, Nos. 0 to 18, 70¢ to 10¢

Br. and Ann'd, Nos. 16 to 18..... 80¢

Br. and Ann'd, Nos. 19 to 20..... 80¢

Br. and Ann'd, Nos. 27 to 30..... 82¢ to 5¢

Tinned..... 33¢ to 40¢

Tinned Broom Wire, 18 to 21, # 1/2..... 44¢

Galvanized Fence, Nos. 8 and 9..... 70¢ to 10¢

Brass, list Jan. 18, 1884..... 25¢ to 33¢

Copper, list Jan. 18, 1884..... 33¢ to 40¢

Annealed Wire on Spools..... 60¢

Malin's Steel and Tin'd on Spools..... 60¢

Malin's Brass and Cop. on Spools..... 50¢

Tate's Spooled, Tin'd & Annealed..... 60¢ to 5¢

Tate's Spooled Cop. and Brass..... 50¢

Cast Steel Wire..... 50¢ to 2, 30¢

Steel Music Wire, 12 to 30..... 60¢ to 70¢

Wire Clothes Line, see Lines.

Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard list..... 80¢ to 20¢ to 85¢

Wire Cloth and Netting—

Painted Screen Cloth, good quality, # 100 sq. ft. \$1.40

Galvanized Wire Netting..... 70¢ to 10¢ to 75¢

Wire, Barb—

See Trade Report.

Wire Rope—See Rope, Wire.**Wrenches—**

American Adjustable..... 40¢

Baxter's Adjustable "S"..... 40¢ to 10¢ to 50¢

Baxter's Diagonal..... 60¢

Coe's Genuine..... 50¢ to 3¢

Coe's "Mechanics"..... 50¢ to 10¢ to 35¢

Girard Standard..... 60¢ to 10¢

Lamson & Sessions' Engineers..... 70¢ to 10¢

P. S. & W. Agricultural..... 75¢ to 10¢

Girard Agricultural..... 75¢ to 10¢ to 10¢

Lamson & Sessions' Agric'l..... 75¢ to 10¢ to 10¢

Bemis' Calf's..... 35¢

Pat. Combination..... 35¢

Merrick's Pattern..... 35¢

Brigg's Pattern..... 25¢

Cylinder or Gas Pipe..... 40¢ to 5¢

No. 3 Pipe..... 40¢ to 10¢

Aiken's Pocket (Bright)..... \$3.00, 50¢ to 10¢

The Favorite Pocket..... # doz., \$4.00, 40¢

Webster's Pat. Combination..... 25¢

Boardman's..... 30¢

Always Ready..... 25¢ to 3¢

Alligator..... 50¢

Donohue's Engineer..... 20¢ to 10¢

Acme, Bright..... 50¢ to 25¢

Acme, Nickle'd..... 40¢ to 25¢

Hercules..... 70¢ to 25¢

Walker's..... 55¢ to 3¢

Diamond Steel..... 55¢ to 3¢

Cincinnati Brace Wrenches..... 25¢ to 10¢

Taft's Vise Wrench..... 55¢ to 10¢ to 3¢

Paints, Oils and Colors.—Wholesale Prices.**Animal and Vegetable Oils—**

Linseed, City, raw... per gal. 41
Linseed, City, boiled... 44
Linseed, Western, raw... 40
Lard, City, Extra Winter... 63
Lard, City, Prime... 63 1/2
Lard, City, Extra No. 1... 50
Lard, City, No. 1... 40
Lard, Western, prime... 62
Cotton-seed, Crude, prime... 28
Cotton-seed, Crude, off grades... 26
Cotton-seed, Summer Yellow, prime... 30
Cotton-seed, Summer Yellow, off grades... 27
Sperm, Crude... 87
Sperm, Natural Spring... 87
Sperm, Bleached Spring... 72
Sperm, Natural Winter... 73
Sperm, Bleached Winter... 78
Whale, Crude... 45
Whale, Natural Winter... 58
Whale, Bleached Winter... 58
Whale, Extra Bleached... 59
Sea Elephant, Bleached Winter... 62
Menhaden, Crude, Sound... 30
Menhaden, Crude, Southern... 30
Menhaden, Light Pressed... 38
Menhaden, Bleached Winter... 40
Menhaden, Extra Bleached... 42
Tallow, City, prime... 44
Tallow, Western, prime... 42
Cocoanut, Ceylon... 54
Cocoanut, Cochin... 54
Cod, Domestic... 38
Cod, Foreign... 42
Red Elaine... 34
Red Saponified... 44
Bank... 35
Straits... 36
Olive, Italian... 64
Neatsfoot, prime... 50
Palm, prime, Lagos... 54

Mineral Oils—

Black, 29 gravity, 25 to 30 cold test... per gal. 7
Black, 29 gravity, 15 cold test... 7 1/2
Black, 29 gravity, summer... 6
Cylinder, light, filtered... 14

Cylinder, dark, filtered... 10
Paraffine, 24 gravity... 11 1/2
Paraffine, 25 gravity... 10 1/2
Paraffine, 28 gravity... 8
Paraffine, red... 9

Paints and Colors—

Barytes, Foreign, # ton... 22.00
Barytes, Amer. floated... 22.00
Barytes, Amer. No. 1... 15.00
Barytes, Amer. No. 2... 13.00
Barytes, Amer. No. 3... 11.00
Blue, Celestial... 6
Blue, Chinese... 40
Blue, Prussian... 25
Blue, Ultramarine... 8
Brown, Spanish... 3
Brown, Vandyke, Amer... 3
Brown, Vandyke, English... 3
Carmine, No. 40, in bulk... 3.10
Carmine, No. 40, in boxes or barrels... 3.20
Carmine, No. 40, in ounce bottles... 4.20
Chalk, in bulk... 100
Chalk, in bbls... 100
China Clay, English... 13.00
Cobalt Oxide, prep'd... 4.00
Cobalt Oxide, black... 2.50
Cobalt Oxide, black, less 100 lb... 2.65
Green, Paris, in bulk... 13
Green, Paris, 170 to 175 lbs... 15
Kegs... 14
Green, Chrom. ordinary... 12
Green, Chrom. pure... 22
Lead, Eng., B.B. white... 8
Lead, Amn. White, dry or in oil: Kegs, lots less than 500 lb... 7 1/2
Kegs, lots 500 lb to 5 tons... 6 1/2
Kegs, lots 5 tons to 12 tons... 6 1/2
Kegs, lots 12 tons and over... 6 1/2
Lead, White, in oil, 25 lb tin pails, add to keg price... 1
Lead, White, in oil, 12 1/2 lb tin pails, add to keg price... 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price... 1
Lead, Red, bbls, and 1/2 bbls... 6 1/2
Lead, Red, kegs... 6 1/2
Litharge, kegs... 6 1/2
Litharge, bbls, and 1/2 bbls... 6 1/2

TERMS, &c.—Lead and Litharge.—On lots of 500 lb or over, 60 days' time or 2 1/2 % discount for cash if paid within 15 days of date of invoice.

Ocher, French Washed... 1 1/2
Ocher, German Washed... 1 1/2
Ocher, American... 1 1/2
Orange Mineral, English... 8
Orange Mineral, French... 10
Orange Mineral, German... 8
Orange Mineral, American... 8
Paris White, English Cliff-stone... 1.00
Paris White, American... 70
Red, Indian, English... 5
Red, Indian, American... 9
Red, Tuscan... 9
Red, Venetian, American... 100
Sienna, Italian, Burnt and Powder... 4
Sienna, Ital., Burnt Lumps... 1 1/2
Sienna, Ital., Raw, Powder... 1 1/2
Sienna, Ital., Raw, Lumps... 1 1/2
Sienna, American, Raw... 1 1/2
Sienna, American, Burnt and Powdered... 1 1/2
Talc, French... 1 1/2
Talc, American... 1 1/2
Terra Alba, Fr'ch... 75
Terra Alba, English... 70
Terra Alba, American No. 1... 70
Terra Alba, American No. 2... 45
Umber, Turkey, Burnt and Powdered... 3 1/2
Umber, Turkey, Bnt. Amer... 1 1/2
Umber, Turkey, R'w Amer... 1 1/2
Yellow, Chrom. pure... 10
Vermilion, American Lead... 11 1/2
Vermilion, Quicks'cr, bulk... 57
Vermilion, Quicks'cr, bags... 58
Vermilion, Quicksilver am'r pks... 62
Vermilion, English Import... 85
Vermilion, Imitation, Eng... 8
Vermilion, Trieste... 90
Vermilion, Chinese... 92 1/2
Whiting Common, # 100 lb... 37 1/2
Whiting Gilders... 45

Zinc, American, dry... 4 1/2
Zinc, French, Red Seal... 9
Zinc, French, Green Seal... 7
Zinc, French, V. M. X... 7
Zinc, Antwerp, Red Seal... 7 1/2
Zinc, Antwerp, Green Seal... 7 1/2
Zinc, German, L. Z. O... 6 1/2
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over... 10 1/2
lots less than one ton... 11
Zinc, V. M. in Poppy Oil, Red Seal... 10
lots of 1 ton and over... 10 1/2
lots of less than 1 ton... 10 1/2
Discou'rs.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 15; 25 bbls., 2%; 50 bbls., 4%. No discount allowed on less than bbl. lots.

Colors in Oil—

Black, Drop, Frankfort... 25
Black, Drop, English... 12
Black, Drop, Domestic... 7
Black, Lampblack, Best... 20
Black, Lampblack, Common... 7
Black, Ivory... 8
Blue, Chinese... 35
Blue, Prussian... 20
Blue, Ultramarine... 12
Brown, Vandyke... 12
Green, Chrome... 8
Green, Paris... 16
Sienna, Raw... 7
Sienna, Burnt... 7
Umber, Raw... 7
Umber, Burnt... 7

Putty—

In barrels and 1/2 bbls... 0.15
In tubs... 0.15
In tin cans... 0.15
In bladders... 0.15

Spirits Turpentine—

In regu bbls... 29 1/2
In machine bbls... 30

Glue—

Low Grade... 8
Cabinet... 12
Medium White... 13
Extra White... 17
French... 10
English... 10
Irish... 12

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